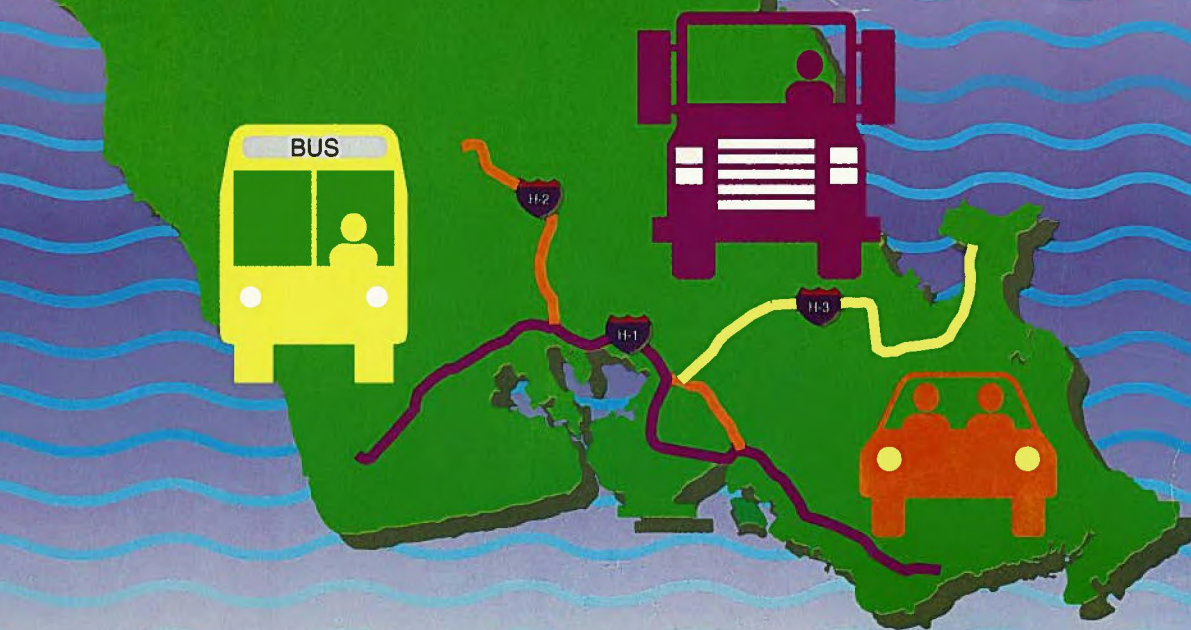


Oahu Regional Transportation Plan



Prepared For:

**Oahu Metropolitan
Planning Organization**

Prepared By:

KAKU ASSOCIATES
A Corporation

In Association with:

Parsons Brinckerhoff

2020 OAHU REGIONAL TRANSPORTATION PLAN

November, 1995

Prepared for:

OAHU METROPOLITAN PLANNING ORGANIZATION

Prepared by:

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THE
FEDERAL
BUREAU OF
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DEPARTMENT OF JUSTICE
WASHINGTON, D. C. 20535

MEMORANDUM FOR THE DIRECTOR, FBI

SUBJECT: [Illegible]

DATE: [Illegible]

TO: [Illegible]

FROM: [Illegible]

RE: [Illegible]

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EXECUTIVE SUMMARY

As the designated metropolitan planning organization for the island of Oahu, the Oahu Metropolitan Planning Organization (OMPO) is responsible for carrying out the various requirements of the metropolitan transportation planning process. These requirements are mandated by the Federal Department of Transportation as the means of verifying the eligibility of metropolitan areas for Federal funds earmarked for ground transportation systems. They are currently promulgated to state, regional, and local agencies through the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. ISTEA has identified that one of the processes that must be satisfied and products that must be developed is the Regional Transportation Plan (RTP) for the Island of Oahu.

This document is an update of a plan that was first adopted in 1976 and has been updated twice since, in 1984 as *Hali 2000* and in 1991 as the Oahu Regional Transportation Plan (*Hali 2005*). This update is the first under the requirements established by the current federal statute (ISTEA).

PURPOSE OF THE REGIONAL TRANSPORTATION PLAN

OMPO and its participating agencies are responsible for the preparation of the Oahu Regional Transportation Plan (ORTP), which serves as a guide for the development of the major surface transportation facilities and programs to be implemented on Oahu. The plan is intended to identify short-range and long-range (to the year 2020) strategies and actions that will lead to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods. Although the plan must respond to the location and magnitude of potential capacity and circulation deficiencies in the major travel corridors of the island, it is not intended to resolve all issues associated with the preparation of specific details for each of the plans and programs within the plan. While all issues related to future needs and deficiencies which were identified as part of the planning process used to develop the plan are addressed, some may be addressed in a conceptual or generic manner. The latter serve as "placeholders"

in order to qualify for federal funding rather than as an indicator of a specific project or solution. The contents of the plan must include these references for all plans and actions which are expected to be undertaken as part of the Statewide Transportation Improvement Program (STIP) or other federally funded programs.

FEDERAL REQUIREMENTS

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) establishes new transportation planning requirements for state and local jurisdictions. In order to be eligible for federal transportation funds, communities must comply with the new federal provisions. The Oahu Regional Transportation Plan must be responsive to all applicable requirements of ISTEA. ISTEA requires that OMPO, in cooperation with its participating agencies, develop an RTP that is updated at least every five years. The RTP must be directed at a 20-year time horizon and contain a priority list of projects. It must also be fiscally constrained, including a financial plan indicating the resources reasonably expected to be available to fund the 20+ year transportation plan. The RTP must also have input from public officials and citizens.

GOALS AND OBJECTIVES

The goals and objectives of the ORTP were developed at the outset of the study and reflect the issues and concerns raised by participants in the study. They were developed to address the following four issues of relevance to the plan:

- Transportation Services - Goal: develop and maintain Oahu's Island-wide transportation system to ensure efficient, safe, convenient, and economical movement of people and goods.
- Quality of Life - Goal: develop and maintain Oahu's transportation system in a manner which maintains environmental quality and community cohesiveness.
- Community Responsibility - Goal: develop and maintain Oahu's transportation system in a manner that is sensitive to community needs and desires.
- Demand Management - Goal: develop a travel demand management system for Oahu which optimizes use of transportation resources.

PLANNING PROCESS

The Regional Transportation Plan is developed within the context of the comprehensive, cooperative and continuing (3C) planning process established and carried out by the Oahu Metropolitan Planning Organization and its participating agencies. OMPO is the officially designated regional agency that must ensure that the 3C process addresses all federal concerns regarding various transportation modes on Oahu while satisfying the transportation needs of the state and county. The plan is organized to respond to travel needs over a 20- to 25-year time horizon reflecting land use, socioeconomic and travel demand forecasts directed at year 2020.

Participating Agencies

Although OMPO functions as the lead agency, the development of the plan is a cooperative planning effort that includes the significant involvement of agencies from the State of Hawaii and the City and County of Honolulu. These agencies include:

State of Hawaii

- Department of Transportation
- Office of State Planning
- Department of Business, Economic Development & Tourism

City and County of Honolulu

- Department of Transportation Services
- Honolulu Public Transit Authority
- Planning Department

Organizational Structure

Development of the ORTP is guided by an organizational structure which complies with the principles of the 3C process. It includes committees that establish policy, advise and guide the development of all products prepared by OMPO. They include:

- Policy Committee (PC) - The Policy Committee is responsible for adoption of the Regional Transportation Plan.
- Technical Advisory Committee (TAC) - This committee serves as a technical liaison between the Policy Committee and the Executive Director of OMPO.
- ORTP Task Force - The ORTP Task Force consists of agency staff persons and the Chair of the Citizen Advisory Committee, and reviews analysis methodologies, forecasts, and plans for approval by the Technical Advisory Committee.
- Citizen Advisory Committee (CAC) - The role of the CAC is to solicit public input and advise the Policy Committee and the OMPO Executive Director.

STUDY PROCESS

The ORTP was prepared through a study process that included extensive research and analysis by the staffs of OMPO and its participating agencies, the CAC Chair and Vice Chair, and OMPO's consultant. The agencies' staff provided background data, technical guidance and served as a sounding board for potential proposals and solutions. Five key elements of the study process included previous reports and studies, the travel demand forecasting methodology and procedures, alternatives evaluation, funding evaluation, and the public participation program.

PUBLIC PARTICIPATION PROGRAM

The public involvement program is an integral part of the overall planning process used in the development of the Oahu Regional Transportation Plan. The public's input and participation were sought and incorporated at each stage of the study process from confirmation of the work program through development of the goals and objectives and assessment of existing conditions, to the development and use of the travel demand forecasting model, evaluation of future conditions and identification of potential deficiencies, and the development and evaluation of the alternative improvements and strategies. Public input was also used to refine and finalize the Regional Transportation Plan that is the primary subject of this document.

The public outreach program was accomplished through the use of four key elements: special public information meetings designed specifically to discuss the ORTP, presentations to the City

Council Transportation Committee, a newspaper survey, and individual presentations at various community and special interest group meetings.

SUMMARY OF PLAN

The 2020 Oahu Regional Transportation Plan consists of the following four key elements:

- Highway Element
- Transit Element
- Transportation Demand Management Element
- Financial Program

The Highway Element consists of major highway improvements (i.e., roadway widenings and construction of new facilities), as well as transportation system management (TSM) measures such as operational and safety improvements. The Transit Element consists of transit system capacity (i.e., fleet) increases, new bus maintenance facilities, transit centers, other associated transit system programs, and construction of a rapid transit system in the Primary Urban Center (PUC) corridor. The rapid transit system is described as a high-capacity rapid transit system operating on exclusive right-of-way, and could be a rail rapid transit, monorail, light rail, or busway system (the plan does not specify or recommend a specific type of system). The Transportation Demand Management (TDM) Element includes a variety of measures to reduce vehicle demands, including an integrated high-occupancy vehicle (HOV) lane system, park-and-ride lots, bicycle facilities, transportation management associations (TMAs), and measures to encourage reductions in work trips (i.e., rideshare programs, work behavior changes, and parking management). The plan has been developed in three time periods: 1995-2000; 2001-2005; and 2006-2020.

Tables summarizing the plan projects and programs by time period are included in Appendix A. On the highway system, many projects which are currently under construction or in design stages would be constructed during the initial 1995-2000 period. Major projects during this period include completion of H-3, completion of Kapolei Parkway in the Ewa/Kapolei area, and various interchange and street widening projects throughout the island. This period would also see safety and access improvements along the Waianae Coast, including safety and operational

improvements along Farrington Highway and provision of a mauka emergency access route. During the 2001-2005 period, the planned street system in the Ewa/Kapolei area would be substantially completed, including the Ewa North-South Road and various interchange improvements. Additional capacity and operational projects would also be implemented at various locations around the island. During the long-term 2006-2020 period, major roadway improvements are proposed in the Central Oahu area to support projected development levels, including construction of new Central Mauka and Central East-West roads, widening of Kamehameha Highway across Kipapa Gulch, and widening of Kunia Road to Schofield. Also included in this period are widening projects on Farrington Highway around Kahe Point and along Kalanianaʻole Highway in the Kailua and Waiamanalo areas.

Transit improvements during the initial 1995-2000 period are focused primarily on expanding the capacity and service levels of the bus system, including fleet increases, associated improvements to and expansions of maintenance facilities, and various equipment enhancements. This trend is continued in the second period, with the projected ultimate bus fleet size attained by Year 2006. New and improved transit centers are also implemented during the first two periods. During the 2006-2020 period, improvements to the transit system are focussed primarily on construction of the rapid transit system.

Regarding TDM strategies, implementation of a trip reduction ordinance (with associated encouragement of rideshare programs, work behavior changes, parking management, etc.) would occur in the first 5-year period. Formation of new transportation management associations and provision of new park-and-ride lots is envisioned during the first two periods, while mandated parking management strategies would begin in the second period. Bikeway improvements would be implemented throughout the life of the plan.

Major elements of the planned high-occupancy vehicle system would be implemented in the first 5-year period, including the Nimitz Viaduct and H-1 contraflow HOV projects connecting downtown Honolulu with the Central and Leeward areas of the island. Additions during the 2001-2005 period would include ramp improvements at the Waiawa Interchange to provide a direct outbound HOV connection from H-1 to H-2, implementation of HOV contraflow lanes on North King Street after the planned North King Street widening, and extension of the Kalanianaʻole Highway contraflow HOV operation to Hawaii Kai after completion of the current widening project.

HOV system additions during the 2006-2020 period would include construction of median HOV lanes on H-1 from the Waiawa Interchange to Kapolei and HOV lanes on H-1 in East Honolulu from Aina Koa to the Kapiolani Interchange, with direct HOV ramps constructed at the Kapiolani Interchange to connect to HOV lanes on Kapiolani Boulevard.

The financial plan is summarized in Table ES-1. As indicated in the table, costs and revenues have been estimated for each of the three time periods, as well as for the entire plan period. Overall costs to implement the ORTP are estimated to be approximately \$17.9 billion in escalated future year-of-expenditure dollars over the entire 26-year plan period. Projected revenues slightly exceed the estimated costs, resulting in slight surpluses for each of the three plan periods. The revenue forecasts include continuation of traditional federal, state, and city and county funding sources, plus projected developer contributions for those projects which have been assumed to be the responsibility of respective developers in each area, Federal Section 3 discretionary funds, and new revenue sources for the rapid transit system. Although the specific sources and their amounts have not been identified, the plan recommends that the revenue for the rapid transit system be obtained from one or more of several new sources including federal discretionary transit capital funds, gas tax and vehicle registration fee increases, and an excise tax surcharge.

IMPLEMENTATION OF PLAN

The next steps involve the submission of the ORTP to the State of Hawaii so that it can be integrated into the Statewide Transportation Plan, and submission of the ORTP to the Federal Department of Transportation so that it can be certified as the document that identifies the 25-year program of improvements eligible for federal transportation funds. Both steps are the responsibility of OMPO. Additional issues to which attention must be given include consideration of projects that may require major investment studies (MIS), coordination with National Environmental Policy Act (NEPA) and Section 404 of the Clean Water Act procedures, and additional activities required by the various relevant agencies.

TABLE ES-1
ESTIMATED REVENUE AND COST SUMMARY
2020 OAHU REGIONAL TRANSPORTATION PLAN
(Millions of Year-of-Expenditure Dollars)

HIGHWAY AND TDM ELEMENTS

	1995-2000	2001-2005	2006-2020	Total
REVENUES				
Federal [a]	\$522.2	\$511.0	\$2,069.9	\$3,103.1
State M&O Revenues	\$129.2	\$115.8	\$414.0	\$659.0
State Capital Revenues	\$78.6	\$65.7	\$236.6	\$380.9
C&C Highway Fund Revenues to M&O	\$235.6	\$229.6	\$928.2	\$1,393.4
C&C Capital Funds-Highway Share [b]	\$29.3	\$31.1	\$148.1	\$208.5
Developer Funding [c]	\$152.4	\$92.9	\$858.8	\$1,104.1
Revenue Shift (to)/from Transit [d]	(\$30.3)	(\$50.5)	(\$288.0)	(\$368.8)
Total Revenues	\$1,117.0	\$995.6	\$4,367.6	\$6,480.2
COSTS				
Highway Element M&O Costs	\$427.8	\$489.9	\$2,377.1	\$3,294.8
TDM Element M&O Costs	\$28.4	\$55.6	\$261.2	\$345.2
Highway Element Capital Costs	\$609.6	\$381.4	\$1,354.5	\$2,345.5
TDM Element Capital Costs	\$49.7	\$62.7	\$320.8	\$433.2
Total Costs	\$1,115.5	\$989.6	\$4,313.6	\$6,418.7
BALANCE	\$1.5	\$6.0	\$54.0	\$61.5

TRANSIT ELEMENT

	1995-2000	2001-2005	2006-2020	Total
REVENUES				
Federal Section 9 Formula Funds	\$113.1	\$101.3	\$411.6	\$626.0
Federal Section 3 Formula Funds	\$2.8	\$2.8	\$11.2	\$16.8
Federal Section 3 Discretionary Funds [e]	\$17.0	\$15.2	\$61.7	\$93.9
Federal Subtotal	\$132.9	\$119.3	\$484.5	\$736.7
HPTA Operating Revenues [f]	\$189.3	\$219.4	\$1,062.4	\$1,471.1
Rapid Transit Operating Revenues	\$0.0	\$0.0	\$188.2	\$188.2
New Rapid Transit Revenues [g]	\$0.0	\$0.0	\$4,098.9	\$4,098.9
C&C Capital Funds-Transit Share [b]	\$87.9	\$93.2	\$444.2	\$625.3
C&C Revenues for Transit O&M [b]	\$556.6	\$592.5	\$2,845.2	\$3,994.3
Revenue Shift (to)/from Highways [d]	\$30.3	\$50.5	\$288.0	\$368.8
Total Revenues	\$997.0	\$1,074.9	\$9,411.4	\$11,483.3
COSTS				
Bus System O&M Costs [f]	\$779.4	\$903.4	\$4,431.5	\$6,114.3
Rapid Transit O&M Costs	\$0.0	\$0.0	\$1,061.9	\$1,061.9
Bus System Capital Costs [f]	\$217.6	\$171.5	\$692.8	\$1,081.9
Rapid Transit Capital Costs	\$0.0	\$0.0	\$3,225.2	\$3,225.2
Total Costs	\$997.0	\$1,074.9	\$9,411.4	\$11,483.3
BALANCE	\$0.0	\$0.0	\$0.0	\$0.0

PLAN TOTAL

	1995-2000	2001-2005	2006-2020	Total
REVENUES	\$2,114.0	\$2,070.5	\$13,779.0	\$17,963.5
COSTS	\$2,112.5	\$2,064.5	\$13,725.0	\$17,902.0
BALANCE	\$1.5	\$6.0	\$54.0	\$61.5

Notes:

- a. Oahu's share of statewide federal allocation assumed at 66%.
- b. Includes both Highway Fund & General Fund revenues.
- c. Assumes developer funding for selected projects.
- d. C&C or Federal (CMAQ or STP) flexible revenue shifts to balance highway & transit elements.
- e. Assumes Federal Section 3 discretionary funding at approximately 15% of level of Section 9 formula funding.
- f. Assumes 715-vehicle bus fleet & 125-vehicle Handi-Van fleet.
- g. Potential rapid transit funding sources include federal discretionary transit capital funds, gas tax & vehicle registration fee increases, & an excise tax surcharge.

I. INTRODUCTION

As the designated metropolitan planning organization for the two urbanized areas on the Island of Oahu, Honolulu and Kailua-Kaneohe, the Oahu Metropolitan Planning Organization (OMPO) is responsible for carrying out the various requirements of the metropolitan transportation planning process. These requirements are mandated by the Federal Department of Transportation as the means of verifying the eligibility of metropolitan areas for Federal funds earmarked for ground transportation systems. They are currently promulgated to state, regional and local agencies through the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. ISTEA has identified that one of the processes that must be satisfied and products that must be developed is the Regional Transportation Plan (RTP) for the Island of Oahu.

This document describes the elements of the Oahu Regional Transportation Plan (ORTP) for 1995 which has been prepared for OMPO. It is an update of a plan that was first adopted in 1976 and has been updated twice since, in 1984 as *Hali 2000* and in 1991 as the Oahu Regional Transportation Plan (*Hali 2005*). This update is the first under the requirements established by the current federal statute (ISTEA).

PURPOSE OF THE REGIONAL TRANSPORTATION PLAN

OMPO and its participating agencies are responsible for the preparation of the Oahu Regional Transportation Plan, which serves as a guide for the development of the major surface transportation facilities and programs to be implemented on Oahu. The plan is intended to identify short-range and long-range (to the Year 2020) strategies and actions that will lead to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods. Although the plan must respond to the location and magnitude of potential capacity and circulation deficiencies in the major travel corridors of the island, it is not intended to resolve all issues associated with the preparation of specific details for each of the plans and programs within the plan. While all issues related to future needs and deficiencies

which were identified as part of the planning process used to develop the plan are addressed, some may be addressed in a conceptual or generic manner. The latter serve as "placeholders" in order to qualify for federal funding rather than as an indicator of a specific project or solution. The contents of the plan must include these references for all plans and actions which are expected to be undertaken as part of the Statewide Transportation Improvement Program (STIP) or other federally funded programs.

The RTP also contains a financial element that identifies both current and potential future sources of revenue that may be available for the implementation of this plan. The financial element of the plan illustrates the relationship of these revenue projections with the estimates of costs associated with the implementation and operation of each of the transportation plans and programs contained in the plan.

GOALS AND OBJECTIVES

The goals and objectives of the ORTP were developed at the outset of the study and reflect the issues and concerns raised by participants in the study. They were developed to address the following four issues of relevance to the plan:

- Transportation Services
- Quality of Life
- Community Responsibility
- Demand Management

As summarized in Table 1-1, a system goal and a series of objectives were developed for each of the above elements. The specific objectives listed in the table were used to develop the criteria used to evaluate the various alternative transportation scenarios considered in the study. This ensured that the final contents of the plan reflected and were truly responsive to the goals of the plan.

TABLE 1-1
GOALS AND OBJECTIVES
OAHU REGIONAL TRANSPORTATION PLAN

I. TRANSPORTATION SERVICES	
<u>System Goal:</u>	
Develop and maintain Oahu's Island-wide transportation system to ensure efficient, safe, convenient, and economical movement of people and goods.	
<u>Objectives:</u>	
#1:	Increase peak period person-carrying capacities on Oahu highways through measures to encourage higher vehicle occupancies.
#2:	Provide peak period transit service to Oahu transit riders which is convenient and cost-effective.
#3:	Provide off-peak highway and transit service to communities on Oahu in a cost-effective manner.
#4:	Provide adequate facilities for the efficient movement of goods on Oahu.
#5:	Encourage the availability of adequate public and private services between Waikiki, the airport, and other tourist destinations.
#6:	Promote intermodal efficiency of harbor terminal facilities and land transportation systems.
#7:	Promote intermodal efficiency of airport terminal facilities and land transportation systems.
#8:	Ensure that physically-challenged, elderly, and economically-disadvantaged persons have reasonable access to transportation services, as provided for by Federal, State, and local legislation.
#9:	Ensure user and community safety in the physical design and operation of new and existing transportation facilities.
#10:	Ensure that Oahu's transportation system is planned, designed, and operated in an integrated and cost-effective manner.
#11:	Enhance the performance of Oahu's transportation system through the use of operation management strategies.

TABLE 1-1 (continued)
GOALS AND OBJECTIVES
OAHU REGIONAL TRANSPORTATION PLAN

II. QUALITY OF LIFE	
<u>System Goal:</u>	
Develop and maintain Oahu's transportation system in a manner which maintains environmental quality and community cohesiveness.	
<u>Objectives:</u>	
#12:	Develop and maintain Oahu's transportation system to meet noise, air, and water quality standards set by Federal and State agencies.
#13:	Preserve Oahu's cultural integrity and scenic beauty, including sea and mountain vistas.
#14:	Encourage the public and private sectors to participate in the development and maintenance of "low-energy" transportation facilities, including bikeways, walkways, and other energy efficient elements which can be safely integrated with other transport modes.
#15:	Ensure that energy availability and cost are considered in the development and maintenance of Oahu's transportation system.
#16:	Encourage energy conservation in transportation.
#17:	Minimize disruption of existing neighborhoods due to transportation system construction.
#18:	Ensure that transportation facility design and maintenance are compatible with the planned physical and social character of new and existing developments.
#19:	Maintain and upgrade the existing and future transportation system in a manner that is aesthetically pleasing, including incorporation of landscaping and tree planting.
#20:	Develop transportation contingency plans for energy shortages, natural and man-made disasters, and other emergencies that would impact the transportation system.

TABLE 1-1 (continued)
GOALS AND OBJECTIVES
OAHU REGIONAL TRANSPORTATION PLAN

III. COMMUNITY RESPONSIBILITY
<p><u>System Goal:</u></p> <p>Develop and maintain Oahu's transportation system in a manner that is sensitive to community needs and desires.</p>
<p><u>Objectives:</u></p> <p>#21: Maintain and improve the transportation system to reinforce Oahu's planned population distribution and land use development policies through coordinated efforts of the public and private sectors.</p> <p>#22: Encourage innovation in planning, design, and maintenance of transportation services and facilities that supports community goals.</p> <p>#23: Base transportation improvements for Oahu on a cooperative, comprehensive, and continuing planning process with emphasis on community involvement.</p> <p>#24: Encourage public-private partnerships to provide transportation services.</p> <p>#25: Maintain and improve Oahu's transportation system in a manner consistent with Federal requirements and regulations.</p>
IV. DEMAND MANAGEMENT
<p><u>System Goal:</u></p> <p>Develop a travel demand management system for Oahu which optimizes use of transportation resources.</p>
<p><u>Objectives:</u></p> <p>#26: Encourage increases in system-wide ride-sharing on Oahu.</p> <p>#27: Maximize the efficient use of the public transportation system.</p> <p>#28: Encourage reductions in single occupancy vehicle travel during peak periods, particularly in the primary urban center.</p>

PLANNING PROCESS

The Regional Transportation Plan is developed within the context of the comprehensive, cooperative and continuing (3C) planning process established and carried out by the Oahu Metropolitan Planning Organization and its participating agencies. OMPO is the officially designated regional agency that must ensure that the 3C process addresses all federal concerns regarding various transportation modes on Oahu while satisfying the transportation needs of the state and county. The plan is organized to respond to travel needs over a 20- to 25-year time horizon reflecting land use, socioeconomic and travel demand forecasts directed at year 2020.

Participating Agencies

Although OMPO, as the designated agency responsible for the preparation of the ORTP, functions as the lead agency, the development of the plan is a cooperative planning effort that includes the significant involvement of agencies from the State of Hawaii and the City and County of Honolulu. These agencies include:

State of Hawaii

- Department of Transportation (DOT)
- Office of State Planning (OSP)
- Department of Business, Economic Development & Tourism (DBEDT)

City and County of Honolulu

- Department of Transportation Services (DTS)
- Honolulu Public Transit Authority (HPTA)
- Planning Department (PD)

The State of Hawaii Department of Transportation (HDOT) is responsible for a number of major products related to the ORTP. These include the Statewide Transportation Plan (STP), within which the ORTP will be included, and the Statewide Transportation Improvement Program (STIP).

The Department of Business, Economic Development and Tourism (DBEDT) generally provides the statewide and countywide control totals for all socioeconomic and demographic forecasts used in the development of the ORTP.

The City and County of Honolulu Department of Transportation Services (DTS) is responsible for the overall planning of local transportation facilities including public transit, highways, parking system, and any relevant transportation demand management activities.

The Honolulu Public Transit Authority (HPTA) administers and operates the public transit system via TheBus, Handi-Van services, and contracted transit service throughout Oahu.

The Planning Department is responsible for the development of the socioeconomic forecasts used for the development of travel demand forecasts for the ORTP on a detailed traffic analysis zone (TAZ) basis for Oahu.

Organizational Structure

Development of the ORTP is guided by an organizational structure which complies with the principles of the 3C process. It includes committees that establish policy, advise, and guide the development of all products prepared by OMPO. They include:

- **Policy Committee (PC)** - The Policy Committee is responsible for adoption of the Regional Transportation Plan. The committee is composed of elected officials, or their appointees. The committee composition includes five members from the City Council, three member from the State Senate, three members from the State House, one member appointed by the Mayor, and one member appointed by the Governor.
- **Technical Advisory Committee (TAC)** - This committee is composed of the directors of the City and State departments of transportation and planning. These departments include DTS, HPTA, PD, HDOT, DBEDT, and OSP. The Federal Highway Administration, the Federal Transit Administration, and the Federal Aviation Administration are non-voting members. The committee serves as a technical liaison between the Policy Committee and the Executive Director of OMPO.
- **ORTP Task Force** - The ORTP Task Force consists of agency staff persons and the Chair of the Citizen Advisory Committee, and reviews analysis methodologies, forecasts, and plans for approval by the Technical Advisory Committee.
- **Citizen Advisory Committee (CAC)** - The committee members are appointed by the Policy Committee, with member organizations representing a broad range of interest groups. The role of the CAC is to solicit public input and advise the Policy Committee and the OMPO Executive Director. The CAC assists the planning effort by identifying the concerns and issues regarding transportation needs, and by reviewing potential plans and programs. The CAC Chair and Vice Chair also participated in the ORTP Task Force.

Federal Requirements

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) establishes new transportation planning requirements for state and local jurisdictions. In order to be eligible for federal transportation funds, communities must comply with the new federal provisions. The Oahu Regional Transportation Plan (ORTP) for 1995, which serves to update and augment the previous Oahu Regional Transportation Plan (*Hali 2005*), 1991, must be responsive to all applicable requirements of ISTEA. ISTEA requires that OMPO, in cooperation with its participating agencies, develop an RTP that is updated at least every five years. The RTP must be directed at a time horizon of at least 20 years and contain a priority list of projects. It must also be fiscally constrained, including a financial plan indicating the resources reasonably expected to be available to fund the 20+ year transportation plan. The RTP must also have input from public officials and citizens.

The Oahu Transportation Improvement Program (TIP) is a short-term project implementation program. Projects in the Oahu TIP must be consistent with the Oahu Regional Transportation Plan. The TIP is a three-year program, updated at least every two years, with a scheduled annual review. Although both the RTP and the TIP must include a financial plan to illustrate that the resources needed to fund the program can reasonably be expected to be available, the financial requirements are more stringent for the TIP.

Federal requirements indicate that all products of the metropolitan planning process, including the ORTP and the Oahu TIP, must consider the following 15 factors identified in 23 CFR Section 450.316:

1. Preservation and efficient use of existing transportation facilities;
2. Consistency of transportation planning with applicable energy conservation programs, goals and objectives;
3. Traffic congestion relief and prevention;
4. Consistency with and impact on land use plans;
5. Programming of expenditures of enhancement activities;
6. Effects of all transportation projects without regard to the source of funding;
7. Access to intermodal, recreational, and military facilities;
8. Connectivity of roads between metropolitan and non-metropolitan areas;
9. Transportation needs identified through the management systems;
10. Preservation of rights-of-way for future transportation projects;
11. Enhancement of the efficient movement of freight;

12. Use of life-cycle costs for tunnels, bridges, and pavement;
13. Overall social, economic, energy, and environmental affects of transportation decisions;
14. Expansion, enhancement, and increased use of transit services; and
15. Transit system security.

Relationship to Area Master Plans

The ORTP has been designed to identify and respond to transportation demands and potential deficiencies at the major travel corridor level. It includes plans and programs which address regional transportation issues and provide both specific and conceptual improvements that are developed on a regional scale. The ORTP is not intended to serve as a replacement for the circulation elements for Development Plan Areas or large project master plans. The circulation needs for these areas must be developed within a context that is consistent with the level of detail of each. Once transportation circulation patterns and improvements have been identified as part of Development Plans or master plans, the ORTP can include improvements developed as part of these plans. For example, the portion of the ORTP which addresses the Ewa Region includes several facilities, which are not necessarily on a regional scale or major travel corridor level of detail, because they were identified in the Ewa Region Highway Transportation Master Plan. In contrast, the Waikiki Regional Traffic Impact Plan study was ongoing when the ORTP was completed, and the recommendations of this study can be included in the next update of the ORTP.

STUDY PROCESS

The ORTP was prepared through a study process that included extensive research and analysis by the staffs of OMPO and its participating agencies, the CAC Chair and Vice Chair, and OMPO's consultant. The agencies' staffs provided background data and technical guidance and served as a sounding board for potential proposals and solutions. Five key elements of the study process include previous reports and studies, the travel demand forecasting methodology and procedures, alternatives evaluation, funding evaluation, and the public participation program.

Previous Reports and Studies

The most relevant previous reports and studies used to complete this study effort in the preparation of the ORTP include:

- *The Oahu Regional Transportation Plan (Hali 2005), 1991*
- *Hali 2000 Study Alternatives Analysis, 1984*
- *Transportation Systems Management Study, 1994*
- *TheBus Comprehensive Operations Analysis, 1993*
- *Comprehensive Bus Facility and Equipment Requirements Study, 1994*
- *Short-Range Transit Plan Update, 1992*
- *Report of the City & County of Honolulu Transportation & Traffic Management Planning Task Force to the City Council Committee on Transportation, 1993*
- *Final Environmental Impact Statement, Honolulu Rapid Transit Program, 1992*
- *Bike Plan Hawaii, A State of Hawaii Master Plan, 1994*

One additional source not listed above, but used in the study, was the list of baseline transportation improvement projects provided by OMPO. This list, which was developed by OMPO in coordination with the State of Hawaii Department of Transportation and City and County of Honolulu Department of Transportation Services and adopted by the Policy Committee, identifies those projects which obtained some prior level of review or acceptance by the City or State. They represent the starting point for future transportation improvements for Oahu and their implementation were considered as "given" assumptions for all forecasts discussed below.

Travel Demand Forecasting

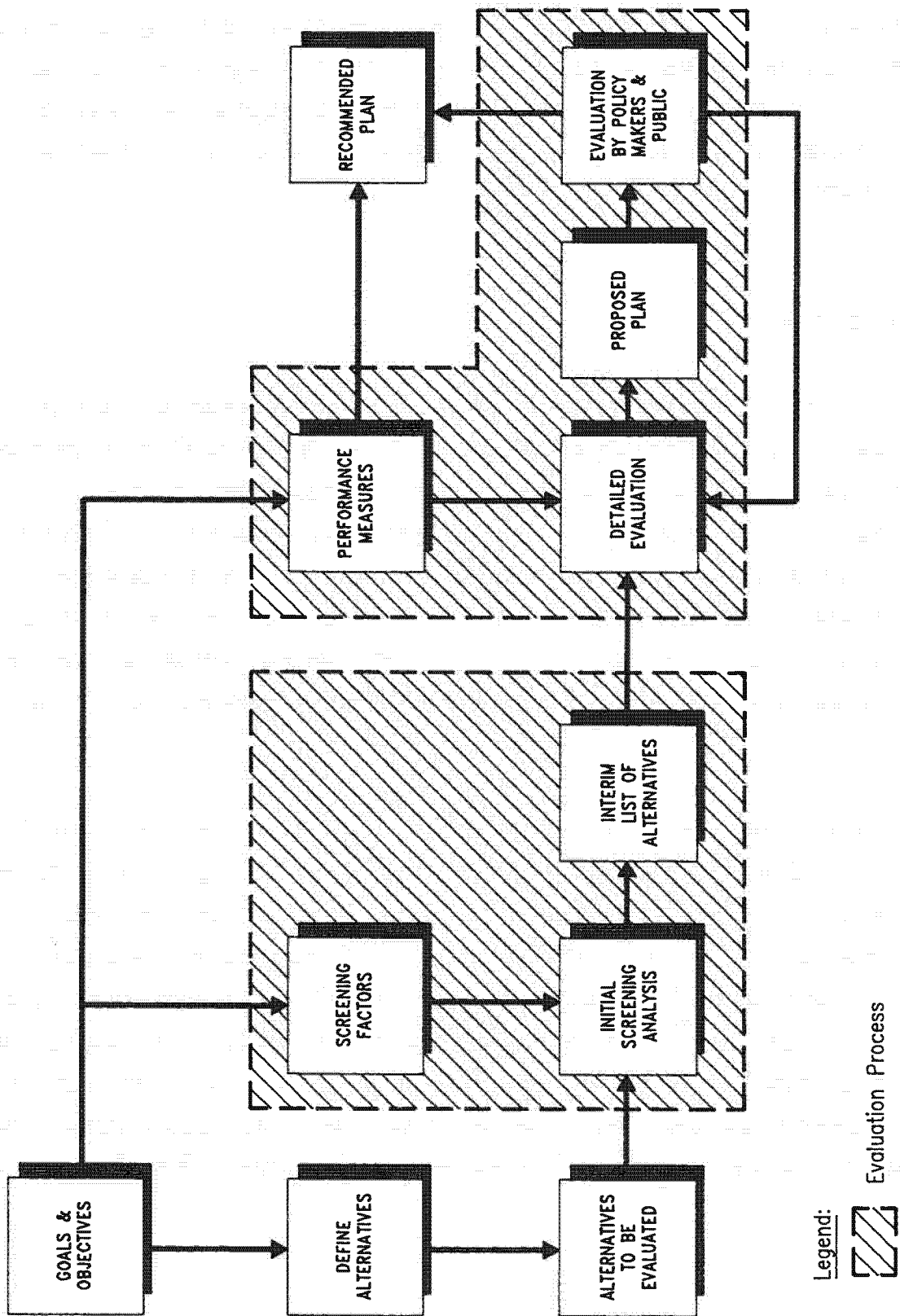
OMPO and its participating agencies are currently using a travel demand forecasting methodology that was initially developed over 25 years ago, but has been updated and modified several times over the years. The current model employs the traditional 4-step structure that includes trip generation, trip distribution, mode choice, and network assignment. Individual components of this chain of programs use travel data and calibration results for several separate model development efforts undertaken by OMPO during this period. The models have been adapted for use on the microcomputer-based software package TRANPLAN. Using socioeconomic data from the City Planning Department, the TRANPLAN-based model was used to complete 3 of the 4 steps in the process: trip generation, trip distribution, and network

assignment. A separate MINUTP-based program was used to develop transit ridership forecasts. The transit direct demand forecasting model, which employs an incremental logit technique to convert changes in socioeconomic data into changes in transit ridership, provides a separate transit trip table which is used in lieu of the mode choice step described above. Travel demand forecasts for this study were developed using this process to provide assignments of vehicle trips on the islandwide network.

Alternatives Evaluation

The study process included the identification of a series of transportation improvement options, including highway improvements to increase capacity, highway improvements to optimize use of existing facilities, transit system improvements that increased capacity, transit system improvements that increased efficiency, and transportation demand management measures that would reduce travel demand. These options were used as the basis for the development of several alternative transportation improvement scenarios. Although each scenario included improvements in each category, they were designed to reflect an emphasis with packages that were primarily directed at increasing highway capacity, increasing transit capacity, or encouraging ridesharing.

An evaluation methodology was developed that included a series of criteria and measures of effectiveness that respond to the goals and objectives established for the plan. The evaluation process is illustrated in Figure 1-1. Each of the evaluation criteria were weighted to illustrate its relative importance in the process. The list of criteria and measures of effectiveness are summarized in Table 1-2. Each alternative scenario was evaluated using this methodology and compared to the baseline plan. The baseline plan includes the existing transportation system with the addition of the set of baseline improvements. The results of the evaluation were used to develop a compromise plan which includes an optimal blend of the various elements from each of the three scenarios. The final ORTP presented in this document reflects the results of this process.



Legend:



Evaluation Process

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FIGURE 1-1
EVALUATION PROCESS

**TABLE 1-2
MEASURES OF EFFECTIVENESS**

Initial Screening

Physical Constraints

Institutional Constraints

Detailed Evaluation

Performance Criteria

Service Effectiveness

Mode Split Percentages

Average Vehicle Occupancy (AVO)

Average Vehicle Ridership (AVR)

Vehicle Miles of Travel (VMT)

Vehicle Hours of Travel (VHT)

Average Travel Time (minutes per trip)

Cost Effectiveness

Daily User Cost Per Employee Vehicle

Total Annualized System Cost

Incremental Cost / Incremental Transit Trips

Incremental Cost / Incremental Vehicle Miles

Congestion Relief Effectiveness

Screenline Levels of Service (LOS)

Screenline V/C Index

Total Vehicle Hours of Delay in Selected Corridors

Planning Objective Effectiveness

Compatibility with Planning Policies

Impact Criteria

Land Use Sensitivity

Noise Impact

Visual Impact

Resource Conservation Impact

Air Quality Impact

Energy Conservation Impact

Funding Evaluation

The plan includes a financial plan which was also developed cooperatively with OMPO and its participating agencies. HDOT and DTS provided information reflecting historic and current funding levels by type, source and potential restriction on its use. The potential revenue available from these sources was projected over the next 25 years to the year 2020 using historical trends and current inflationary guidelines. The potential revenue projected to be available to the Island of Oahu over the next 25 years was compared to the estimated cost to implement the proposed plan. Necessary adjustments were made to the plan that included the following:

- Deletion of individual projects to reduce the cost of the plan
- Scaling back the scope of individual projects to reduce the cost of the plan
- Shifting projects from one time period to another to take advantage of the "cost of money over time"
- Identifying projects, which directly serve future development areas, that can be funded through the participation of developers
- Increased federal funding for capital improvements to the transit system

These adjustments enabled the plan to reach a balance between the available funding and the cost to implement the plan.

Public Participation Program

The public involvement program is an integral part of the overall planning process used in the development of the Oahu Regional Transportation Plan. The public's input and participation were sought and incorporated at each stage of the study process, from confirmation of the work program through development of the goals and objectives and assessment of existing conditions, to the evaluation of future conditions and identification of potential deficiencies, and the development and evaluation of the alternative improvements and strategies. Public input was also used to refine and finalize the Regional Transportation Plan that is the primary subject of this document.

The public outreach program was accomplished through the use of four key elements: special public information meetings designed specifically to discuss the ORTP, presentations to the City

Council Transportation Committee, a newspaper survey, and individual presentations at various community and special interest group meetings. The public participation program is summarized below and more fully described in Appendix B.

Public Information Meetings. A key element of the public participation program was the use of five of the regular meetings of the existing Citizen Advisory Committee (CAC) to conduct the public information meetings. This committee, which is appointed by the OMPO Policy Committee to serve as a standing committee, provides citizen input to the OMPO Policy Committee and the OMPO Executive Director on a variety of subjects for which OMPO is responsible. Since all CAC meetings are open to the public, the regular CAC meetings were considered to be the most appropriate forum for public information meetings for the development of the ORTP. The meetings were held in a workshop format to maximize public opportunity to interact with the OMPO staff and its consultant. Presentations at each meeting included a report on the study progress as well as discussions of key issues associated with the project status.

- **Schedule and Topics of Discussion** - The five public information meetings were held on July 21, 1994, September 22, 1994, October 20, 1994, February 2, 1995, and April 20, 1995. The meetings were held to address specific issues relevant to the study at the time the presentation was made. The relevant topics at the time of each meeting included:

<u>Mtg No.</u>	<u>Date</u>	<u>Topics of Discussion</u>
1.	07/21/94	Description of study including work program, schedule, and products
2.	09/22/94	Goals and objectives, issues to be addressed, description of existing conditions, and evaluation methodology
3.	10/20/94	Identification of future deficiencies, consideration of potential alternative improvements, and further discussion of evaluation methodology
4.	02/02/95	Evaluation of alternative improvement scenarios
5.	04/20/95	Presentation of Draft Plan

- **Notification of Meetings** - OMPO solicited various organizations for their interest in the planning process and informed them about the ORTP project before and during the entire period of the study. Notification of public information meetings were sent to CAC members, Neighborhood Boards, and all interested parties. Prior to January 1995, meeting notices and minutes of the meetings were mailed to over 150 interested parties.

Since then, the mailing list has more than doubled. All meeting attendees were asked to sign a registration sheet, which was used to supplement the mailing list.

A press release was sent to the local newspapers, radio stations and other media, including public relations and public affairs representatives in July, 1994, and January, 1995, to advise the public that the study was ongoing and that special public information meetings were being held. Meeting notices were also specifically published in the *Honolulu Star Bulletin* and *Honolulu Advertiser* prior to each meeting. Finally, notices of meetings were placed in all public libraries on Oahu starting in January, 1995.

OMPO also contacted each of the agencies that had participated in the preparation of the last update of the Oahu Regional Transportation Plan (*Hali 2005*) to solicit interest in this study. All those who responded were added to the CAC mailing list.

In addition to the CAC meetings, two public presentations were made to the City Council Transportation Committee. The first presentation was intended to provide the members of the committee with an overview of the contents of the plan, while the second presentation was designed to allow the committee members to comment on the draft plan and provide any comments to OMPO.

Both the CAC meetings and the City Council Transportation Committee meetings were broadcast multiple times on the 'Olelo cable television system.

Newspaper Survey. OMPO placed a newspaper survey ad in both the *Honolulu Star Bulletin* and *Honolulu Advertiser* in January, 1995, to seek ideas from the public regarding transportation issues on Oahu. The survey questionnaire included a series of questions with regards to several objectives. The first objective was to obtain information regarding the demographic and travel characteristics of the respondent, including residency (i.e., year-round Oahu resident or not), specific neighborhood in Oahu where the respondent resides, normal travel mode to work and/or school, and location of work or school. The second objective was to solicit opinions regarding several potential transportation improvements or strategies, including new highways, increased bus service, rapid transit, busways, carpool lanes, use of contraflow or reversible lanes, mandates for increased carpooling, and congestion pricing.

Over 600 responses were received and tabulated by the OMPO staff. Although the results of the survey do not necessarily provide a statistically valid response, the survey does provide a more accessible forum for the public to identify which transportation improvements they found most

desirable or acceptable. The following provides a summary of some of the more significant responses:

- Over 81% of the respondents travel to and from work/school during the morning and evening peak hours.
- Over 80% of the respondents drive to work/school, 11% travel by bus, and 4% are passengers.
- About 81% of the respondents work or go to school in the Primary Urban Center.
- About 81% agree or strongly agree that more express bus service should be provided.
- About 72% agree or strongly agree that more regular bus service is needed.
- About 56% agree or strongly agree that a rapid transit system should be built.
- About 55% agree or strongly agree that a busway should be built.
- About 60% agree or strongly agree that more contraflow or reversible lanes should be implemented.
- Less than 30% agree or strongly agree that more people should be required to carpool.
- Less than 23% agree or strongly agree that people should be charged a fee to drive during the peak hours.

The survey results are documented in Appendix B.

Individual Presentations. The OMPO Executive Director has also responded to a variety of requests by community groups and organizations to provide presentations on the study and the elements of the RTP as it was being developed. As of mid-May, 1995, a total of 27 of these individual presentations had been made. These presentations have been made to communities (e.g., Mililani, Waipio, Sunset Beach, Haleiwa, Village Park, Whitmore Village), neighborhood boards (e.g., Ewa, Waianae, Pearl City, Kailua, Manana), business organizations (e.g., Rotary Club, Chamber of Commerce, Institute of Transportation Engineers), public agencies (Honolulu Public Transit Authority Board, City Council), development community (e.g., Leeward Oahu Transportation Management Association, Gentry Companies, Plan Pacific, Pacific Marine, Campbell Estates), and University of Hawaii students. Although each of the presentations were tailored to suit the interests and needs of the respective group, each presentation was primarily directed at the study process, alternatives, issues, and the proposed improvement program.

Impact of Public Participation Process. The public participation program was an integral part of the planning process and provided input which was used to refine and modify both the planning process and the results of the study. Many of the comments received from the public were suggestions that were already reflected in the ORTP and required no changes. Other public input resulted in changes to either the evaluation process or the final recommendations, such as:

- Inclusion of the Waianae Coast Mauka emergency access route and safety improvements along Farrington Highway as a result of comments from the Waianae Neighborhood Board #24.
- Deletion of the Keeaumoku Street/H-1 interchange improvement as a result of comments from the general public.
- Refinement of the proposed alignment of the Central East-West Road.
- Addition of a widening project on Kunia Road from Royal Kunia to Schofield.
- Revision of the scope of the proposed improvement project on Waipahu Street.
- Deletion of contraflow HOV lanes on Likelike and Pali Highways.
- Deletion of a bus queue-jumper lane on Dillingham Boulevard.
- Deletion of a second eastbound lane on Kalanianaʻole Highway from Lunalilo Home Road to Hanauma Bay Road.
- Deletion of a widening project on Kahekili Highway from Haiku Road to Kamehameha Highway.
- Moving public/private developers' funded projects from unfunded categories to one of equal status with other funded program improvements.
- Changes to the evaluation methodology to include a series of weighting schemes for the various evaluation criteria in response to comments from the CAC.

STRUCTURE OF PLAN

The Oahu Regional Transportation Plan consists of the following four key elements:

- Highway Element
- Transit Element

- Transportation Demand Management Element
- Financial Program

Chapter II of this document provides background information regarding socioeconomic and land use trends and forecasts which served as the basis for the development of the ORTP, and the implications of this growth relative to the transportation system. Each of the transportation system elements of the plan (presented in Chapters III, IV and V for the Highway Element, Transit Element and Transportation Demand Management Element, respectively) include a discussion of the existing system, key issues which are addressed by the plan, and the improvements and programs proposed in the plan. The financial program described in Chapter VI includes a discussion of the existing revenue sources, projections of future revenue, an analysis of the costs versus revenues, and a discussion of key issues addressed by the financial program. The implementation plan discussed in Chapter VII provides a summary of actions and responsibilities, review requirements, and the projected schedule of activities.

Appendix A to the plan contains tables listing all plan projects and programs by time period (1995-2000, 2001-2005, and 2006-2020).

II. SOCIOECONOMIC AND TRANSPORTATION CONDITIONS

This chapter describes the background conditions and assumptions which provide a basis for development of the Oahu Regional Transportation Plan. The chapter begins with a presentation of the land use and socioeconomic growth which is forecast for Oahu. This is followed with an evaluation of the implications of this growth on the transportation system, including projections of future travel demands and analysis of potential deficiencies. Included in the latter section is an analysis of future transportation system conditions both with and without implementation of the transportation improvements and programs contained in the Oahu Regional Transportation Plan.

SOCIOECONOMIC GROWTH

The Oahu Regional Transportation Plan has been developed for a horizon year of 2020, in compliance with federal requirements that the RTP encompass a long-range planning horizon of at least 20 years. As such, the plan has been developed based on socioeconomic and land use forecasts provided by the City and County of Honolulu Planning Department for the Year 2020. The Planning Department provided socioeconomic and land use estimates for the 1990 base year as well as the projected growth by the Year 2020.

The Year 2020 scenario assumes continuing development consistent with existing zoning and development trends. Although the DBEDT generally provides statewide and countywide control totals for socioeconomic and demographic forecasts, the Honolulu Planning Department provided the countywide control totals for the socioeconomic and demographic forecasts used in the development of the ORTP. The Planning Department also developed the geographic allocation of the projected countywide growth for Oahu to the detailed traffic analysis zone (TAZ) system used for this study.

The Planning Department developed this allocation in accordance with the land use and development policies articulated in the City and County of Honolulu General Plan, the eight Development Plans, and the City Land Use Ordinance. The General Plan establishes long-range objectives and policies regarding such issues as population, economic activity, housing, physical development and urban design, and the transportation system. The eight Development Plans establish standards and guidelines for land use development and public facilities in the respective development plan areas, including land use designations. The Land Use Ordinance implements the specific zoning regulations and permitting processes which govern land use development on the island.

Table 2-1 summarizes the Year 1990 and Year 2020 socioeconomic projections by development plan area for three key indicators: resident population, residential units, and total employment. Figure 2-1 graphically illustrates the resident population and total employment projections by development plan area.

As can be seen, the islandwide population is projected to increase approximately 28% from 1990 to 2020, from about 836,000 residents in 1990 to over 1,071,000 residents in 2020. Housing units are projected to increase by about 40% on the other hand, reflecting the anticipated continuation of the ongoing trend towards smaller household sizes. Islandwide total employment is projected to grow by approximately 37%, from about 505,500 employees in 1990 to about 691,700 employees in 2020. Also, separate data provided by the Planning Department indicates that tourism is projected to increase by over 50%, with the average daily visitor census (i.e., the number of visitors on the island on an average day) increasing from approximately 87,400 visitors in 1990 to over 132,300 visitors in the Year 2020.

Table 2-1 shows that the highest growth rates are projected in the Ewa and Central Oahu areas, a result of the anticipated continued direction of new development to these areas. Population in the Ewa/Kapolei area is projected to increase by over 82,000 between 1990 and 2020 (the highest increase for any of the eight development plan areas), while employment is projected to increase by almost 55,000 jobs. The Central Oahu area is projected to gain over 47,000 new residents and approximately 27,000 new jobs.

TABLE 2-1
SOCIOECONOMIC PROJECTIONS BY DEVELOPMENT PLAN AREA
2020 OAHU REGIONAL TRANSPORTATION PLAN

Development Plan Area	RESIDENT POPULATION					
	Year 1990		Year 2020			
	Pop.	% of Total	Pop.	% of Total	# Change from 1990	% Change from 1990
Primary Urban Center	432,023	51.7%	507,763	47.4%	75,740	18%
Ewa	42,931	5.1%	125,325	11.7%	82,394	192%
Central Oahu	130,526	15.6%	177,739	16.6%	47,213	36%
East Honolulu	45,654	5.5%	50,551	4.7%	4,897	11%
Koolaupoko	117,694	14.1%	121,543	11.3%	3,849	3%
Koolauloa	14,263	1.7%	15,705	1.5%	1,442	10%
North Shore	15,729	1.9%	20,300	1.9%	4,571	29%
Waianae	37,411	4.5%	52,290	4.9%	14,879	40%
Total	836,231	100.0%	1,071,216	100.0%	234,985	28%

Development Plan Area	RESIDENTIAL UNITS					
	Year 1990		Year 2020			
	Units	% of Total	Units	% of Total	# Change from 1990	% Change from 1990
Primary Urban Center	156,389	56.9%	201,888	52.5%	45,499	29%
Ewa	11,718	4.3%	38,893	10.1%	27,175	232%
Central Oahu	36,262	13.2%	55,726	14.5%	19,464	54%
East Honolulu	15,644	5.7%	19,281	5.0%	3,637	23%
Koolaupoko	34,745	12.6%	39,969	10.4%	5,224	15%
Koolauloa	4,329	1.6%	5,343	1.4%	1,014	23%
North Shore	5,285	1.9%	7,631	2.0%	2,346	44%
Waianae	10,355	3.8%	16,151	4.2%	5,796	56%
Total	274,727	100.0%	384,882	100.0%	110,155	40%

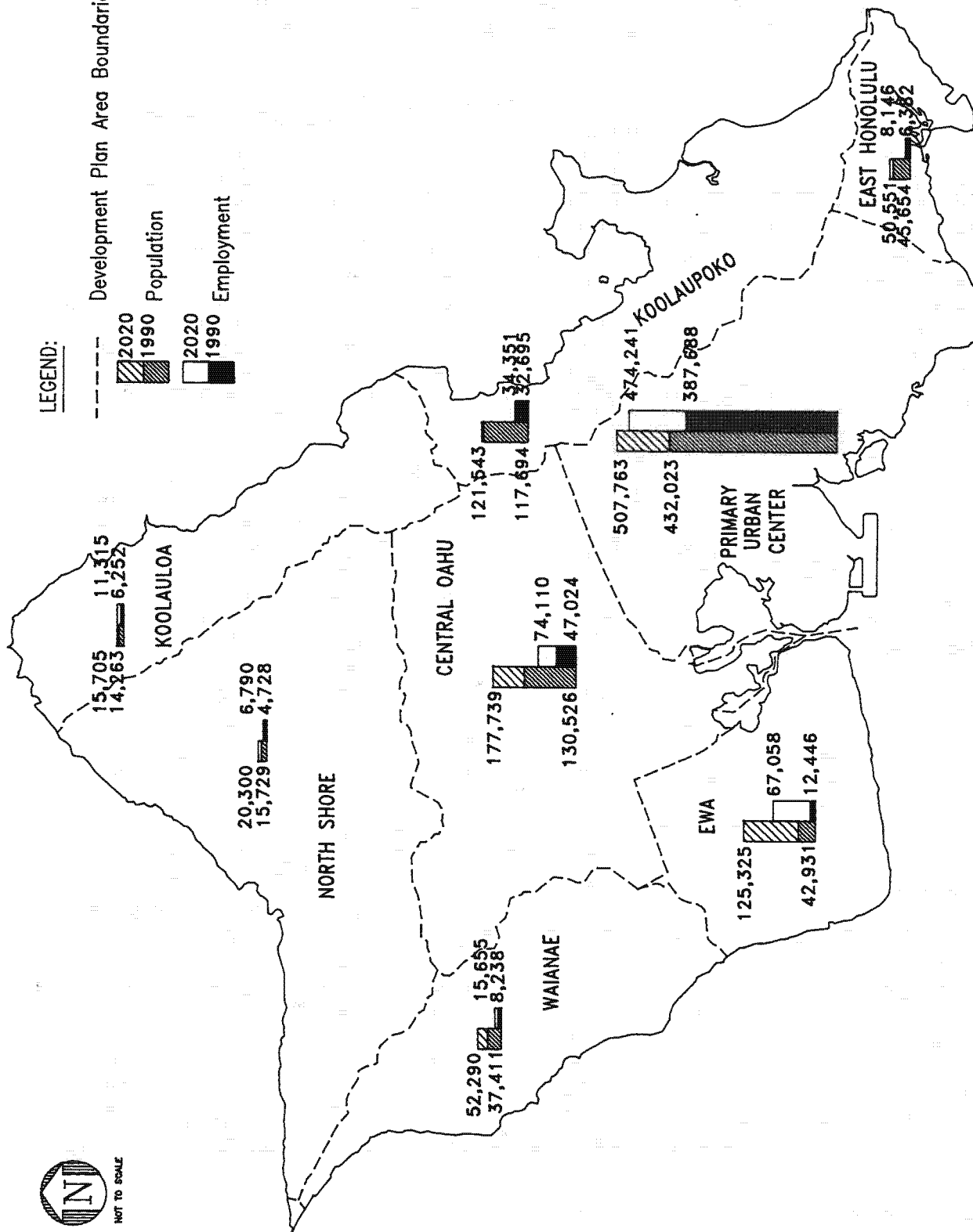
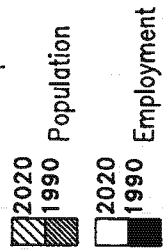
Development Plan Area	TOTAL EMPLOYMENT					
	Year 1990		Year 2020			
	Emp.	% of Total	Emp.	% of Total	# Change from 1990	% Change from 1990
Primary Urban Center	387,688	76.7%	474,241	68.6%	86,553	22%
Ewa	12,446	2.5%	67,058	9.7%	54,612	439%
Central Oahu	47,024	9.3%	74,110	10.7%	27,086	58%
East Honolulu	6,382	1.3%	8,146	1.2%	1,764	28%
Koolaupoko	32,695	6.5%	34,351	5.0%	1,656	5%
Koolauloa	6,252	1.2%	11,315	1.6%	5,063	81%
North Shore	4,728	0.9%	6,790	1.0%	2,062	44%
Waianae	8,238	1.6%	15,655	2.3%	7,417	90%
Total	505,453	100.0%	691,666	100.0%	186,213	37%

Source: City & County of Honolulu Planning Department, June 1994.



LEGEND:

Development Plan Area Boundaries



KAKU ASSOCIATES

FIGURE 2-1
POPULATION AND EMPLOYMENT PROJECTIONS BY DEVELOPMENT PLAN AREA

However, although growth rates in the Primary Urban Center (or PUC, encompassing the area from Pearl City to Kahala) are lower due to the high existing socioeconomic base in the PUC, it should be recognized that the absolute change is still projected to be greatest in the PUC for both residential units and total employment, and would be second only to the Ewa/Kapolei area for population. Relatively modest growth is projected for the Waianae Coast area, while low levels of growth are projected for the East Honolulu, Koolaupoko, Koolauloa and North Shore areas.

The detailed land use data provided by the Planning Department for the Year 1990 base scenario by traffic analysis zone (TAZ) is included in Table C-1 of Appendix C, while the detailed land use projections provided by the Planning Department for the Year 2020 base scenario by TAZ is provided in Table C-2 of Appendix C.

TRANSPORTATION IMPLICATIONS

The socioeconomic characteristics and growth trends discussed above have significant implications relative to the transportation system. Projected increases in resident population, housing units, employment, and tourism have the potential to affect travel patterns in a number of ways. Increases in population, employment, and tourism generate new travel demands. The geographic allocation of this growth affects the distribution and length of trips. In particular, the location of resident population and households relative to employment centers affects travel patterns during peak commute periods.

Travel Demand Forecasts

Year 2020 travel demand forecasts were prepared based on the socioeconomic and land use forecasts provided by the City and County of Honolulu Planning Department as previously described, using the OMPO TRANPLAN travel demand model. Forecasts were prepared for both Year 2020 baseline (i.e., without plan) and Year 2020 with plan conditions. The Year 2020 baseline scenario assumes implementation of baseline transportation improvements which are funded, programmed, or included in the City and County of Honolulu's General Plan (the baseline

improvements are identified in the plan tables in Chapters III, IV and V and in Appendix A with asterisks). The Year 2020 with plan scenario assumed implementation of all of the Oahu Regional Transportation Plan improvements and programs described in Chapters III, IV and V. For comparison, the model was also used to evaluate estimated travel demands for the 1990 base year.

Person Trips. The OMPO model divides the island of Oahu into 284 traffic analysis zones, and estimates tripmaking based on key socioeconomic and land use characteristics (including number of households by size, retail employment, service employment, other employment, and data regarding land uses with special trip generation characteristics) for each of the 284 zones. The traffic analysis zone system is illustrated in Appendix C. Person trip productions and attractions were generated for each TAZ based on the Year 1990 and Year 2020 socioeconomic data presented earlier in this chapter. Table 2-2 summarizes the resulting daily person trips by trip purpose generated by Oahu residents (i.e., not including visitor trips) as estimated by the OMPO trip generation model. As can be seen, an overall increase of approximately 38% in resident person trips is projected from 1990 to 2020, from almost 2,409,000 daily person trips in 1990 to over 3,330,000 daily person trips in 2020. Table 2-3 presents the projected daily resident person trips produced within and attracted to each of the eight development plan areas.

Transit Mode Split. Transit ridership was forecast using the direct demand transit model maintained by the City and County of Honolulu Department of Transportation Services and was merged into the remaining OMPO travel demand model. The projected daily resident transit mode split by trip purpose is presented in Table 2-4. As can be seen, an overall islandwide transit mode split of 7.4% is estimated for 1990, increasing to 9.4% under Year 2020 conditions with the plan. The projected Year 2020 transit splits incorporate a rapid transit system on exclusive right-of-way in the PUC corridor as a baseline improvement, including associated expansion and reconfiguration of the bus system.

Automobile Occupancy. Average vehicle occupancy (AVO) was estimated using the OMPO auto occupancy mode choice model and is also shown in Table 2-4. The estimated AVO's in 1990 range from 1.09 for home-based work trips to 2.28 for home-based school trips. The table also indicates that, for the Year 2020 baseline forecasts (i.e., without new measures to

TABLE 2-2
ESTIMATED DAILY RESIDENT PERSON TRIPS BY PURPOSE
2020 OAHU REGIONAL TRANSPORTATION PLAN

Trip Purpose	DAILY RESIDENT PERSON TRIPS [a]		
	Year 1990	Year 2020	
	Trips	Trips	Change from 1990
Home-Based Work	423,500	590,400	39%
Home-Based School	219,100	294,000	34%
Home-Based Other	864,000	1,170,000	35%
Nonhome-Based	902,200	1,275,900	41%
Total [b]	2,408,900	3,330,300	38%

Notes:

- a. Resident trips only (does not include visitor trips).
- b. Numbers may not sum to totals due to rounding.

TABLE 2-3
ESTIMATED DAILY RESIDENT PERSON TRIPS BY DEVELOPMENT PLAN AREA
2020 OAHU REGIONAL TRANSPORTATION PLAN

Development Plan Area	DAILY RESIDENT PERSON TRIP PRODUCTIONS [a]					
	Year 1990		Year 2020			
	Trips	% of Total	Trips	% of Total	# Change from 1990	% Change from 1990
Primary Urban Center	1,415,400	58.8%	1,774,700	53.3%	359,300	25%
Ewa	90,200	3.7%	339,300	10.2%	249,100	276%
Central Oahu	315,900	13.1%	478,500	14.4%	162,600	51%
East Honolulu	120,000	5.0%	161,900	4.9%	41,900	35%
Koolaupoko	304,800	12.7%	335,300	10.1%	30,500	10%
Koolauloa	36,600	1.5%	53,700	1.6%	17,100	47%
North Shore	38,900	1.6%	52,700	1.6%	13,800	35%
Waianae	86,900	3.6%	134,300	4.0%	47,400	55%
Total [b]	2,408,900	100.0%	3,330,300	100.0%	921,400	38%

Development Plan Area	DAILY RESIDENT PERSON TRIP ATTRACTIONS [a]					
	Year 1990		Year 2020			
	Trips	% of Total	Trips	% of Total	# Change from 1990	% Change from 1990
Primary Urban Center	1,622,000	67.3%	2,046,900	61.5%	424,900	26%
Ewa	61,300	2.5%	295,800	8.9%	234,500	383%
Central Oahu	255,600	10.6%	407,800	12.2%	152,200	60%
East Honolulu	82,200	3.4%	107,700	3.2%	25,500	31%
Koolaupoko	239,100	9.9%	261,600	7.9%	22,500	9%
Koolauloa	42,500	1.8%	59,700	1.8%	17,200	40%
North Shore	32,200	1.3%	42,300	1.3%	10,100	31%
Waianae	74,000	3.1%	108,400	3.3%	34,400	46%
Total [b]	2,408,900	100.0%	3,330,300	100.0%	921,400	38%

Notes:

- a. Resident trips only (does not include visitor trips).
- b. Numbers may not sum to totals due to rounding.

TABLE 2-4
ESTIMATED DAILY RESIDENT TRANSIT MODE SPLIT AND AVERAGE VEHICLE OCCUPANCY
2020 OAHU REGIONAL TRANSPORTATION PLAN

Trip Purpose	TRANSIT MODE SPLIT [a]		
	Year 1990	Year 2020 Baseline	Year 2020 With Plan
Home-Based Work	17.6%	22.5%	22.7%
Home-Based School	13.0%	15.4%	15.5%
Home-Based Other	6.1%	6.2%	6.2%
Nonhome-Based	2.6%	4.6%	4.7%
Total	7.4%	9.3%	9.4%

Trip Purpose	AVERAGE VEHICLE OCCUPANCY (AVO) [a]		
	Year 1990	Year 2020 Baseline	Year 2020 With Plan
Home-Based Work	1.09	1.10	1.28
Home-Based School	2.28	2.28	2.28
Home-Based Other	1.68	1.68	1.80
Nonhome-Based	1.54	1.54	1.65

Notes:

- a. Resident trips only (does not include visitor trips).

significantly encourage ridesharing), it is projected that AVO's will remain relatively stable. With the plan, the AVO for home-to-work trips is projected to increase to 1.28.

Tourist Trips. Tourist trips were estimated separately from resident trips, based on projected growth in the average daily visitor census on the island. Table 2-5 summarizes the results, and shows that approximately 253,000 daily person trips, 43,900 daily transit trips, and 57,100 daily vehicle trips are projected to be generated by the estimated 132,320 daily visitors to the island in the Year 2020, an increase of about 50% over the estimated Year 1990 visitor census and visitor trips.

Projected Screenline Volumes

A total of 26 screenlines have been established as an aid in describing traffic conditions in the major travel corridors throughout the island. The locations of the 26 screenlines are illustrated in Figure 2-2. Table 2-6 presents the daily travel demand forecasts for the major highways crossing each of the screenlines. The table includes estimated total daily person trips, transit person trips, and vehicle trips at each screenline for the Year 1990, Year 2020 baseline, and Year 2020 with plan scenarios. Table 2-7 presents the projected AM peak hour vehicle volumes at each of the 26 screenlines for the three scenarios.

As shown in Table 2-6, the most heavily travelled screenline is the Nuuanu screenline, with an estimated average daily traffic (ADT) volume of almost 415,000 vehicles in 1990, increasing to almost 487,000 ADT under the 2020 baseline scenario and approximately 468,000 ADT under 2020 conditions with the proposed plan. On the other hand, the least travelled screenline is the Makapuu Point screenline, with ADT volumes of less than 7,000 vehicles under each of the scenarios.

The screenlines with the greatest projected absolute growth in both daily person trips and daily vehicle trips from 1990 to 2020 include the Ewa, Waikale, and Farrington screenlines in the Ewa/Kapolei area, the Kipapa and Lumiaina screenlines in Central Oahu, and the screenlines located within the Primary Urban Corridor (Kalauao, Moanalua, Kapalama, Nuuanu, Ward, Manoa-Palolo, and Beretania/King). The screenlines with the highest projected percentage growth in

TABLE 2-5
ESTIMATED DAILY TOURIST TRIPS
2020 OAHU REGIONAL TRANSPORTATION PLAN

	Year 1990	Year 2020
Average Daily Visitor Census	87,410 [a]	132,320 [a]
Daily Visitor Person Trips	167,300	253,000
Daily Visitor Transit Trips	29,000	43,900
Daily Visitor Vehicle Trips	37,700	57,100

Notes:

- a. Source: City & County of Honolulu Planning Department, July 1994.

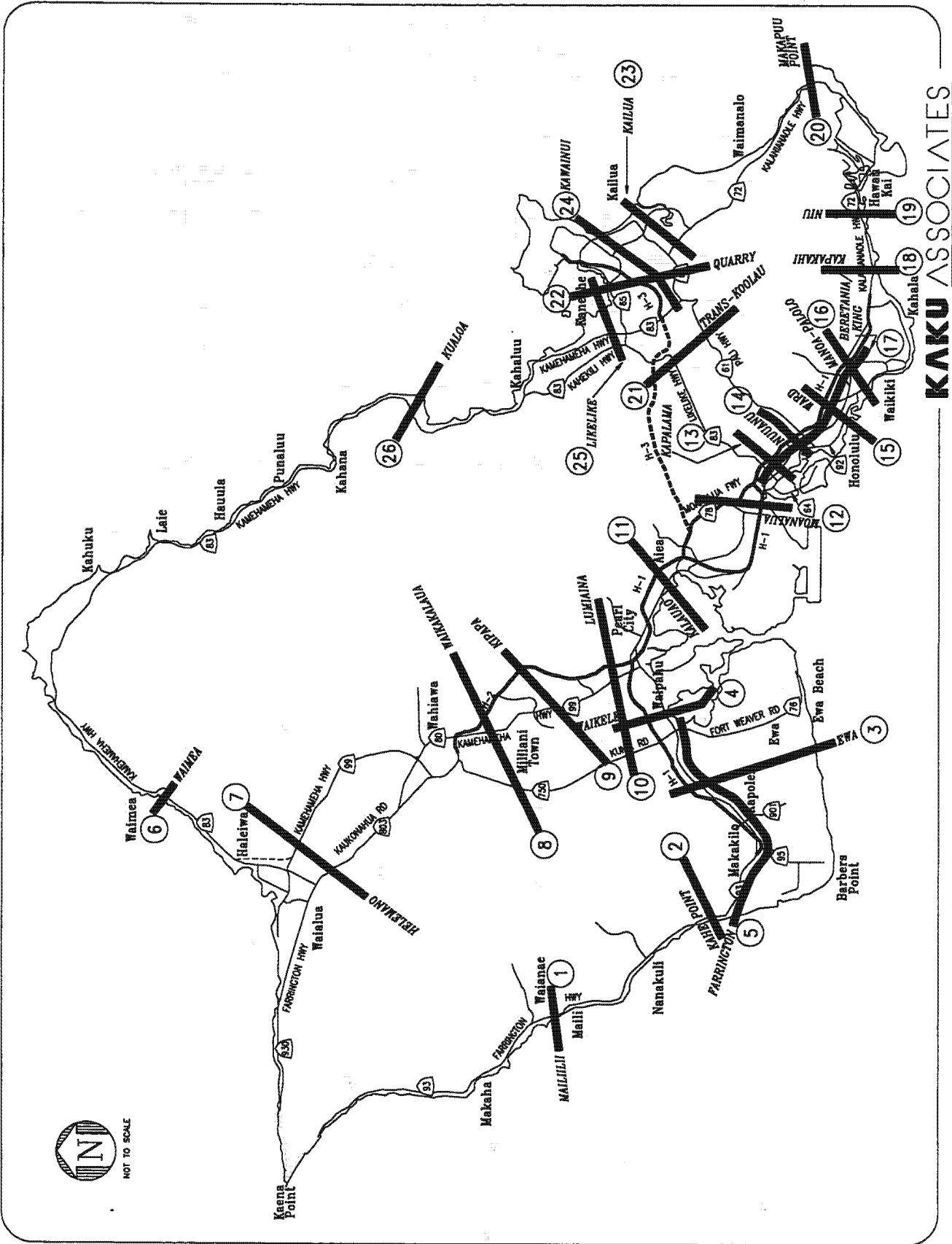


FIGURE 2-2
SCREENLINE LOCATIONS

TABLE 2-6
DAILY TRAVEL FORECASTS BY SCREENLINE
OAHU REGIONAL TRANSPORTATION PLAN

Corridor/ Screenline	1990 BASE MODEL				2020 BASELINE SCENARIO				2020 WITH PLAN SCENARIO			
	Total Person Trips [a]	Transit Person Trips [a]	Vehicle Trips [b]	Change from 1990	Person Trips [a]	Transit Person Trips [a]	Vehicle Trips [b]	Change from 1990	Person Trips [a]	Transit Person Trips [a]	Vehicle Trips [b]	Change from 1990
<i>Ewa/Waianae</i>												
1. Maillili	45,100	3,800	28,700	63%	73,300	9,900	45,700	59%	73,300	9,900	42,900	49%
2. Kahe Point	64,100	4,800	39,500	98%	125,900	14,100	76,000	92%	125,900	14,300	71,100	80%
3. Ewa	83,700	6,200	52,900	224%	271,300	31,800	169,800	221%	271,300	31,900	159,200	201%
4. Waikale	198,300	11,400	128,300	94%	384,800	61,800	235,500	84%	384,600	61,800	220,300	72%
5. Farrington	78,800	2,800	55,800	169%	212,200	25,300	140,300	151%	212,200	25,400	131,700	138%
<i>North Shore</i>												
6. Waimea	14,000	600	10,800	45%	20,300	1,100	16,200	50%	20,300	1,100	15,300	42%
7. Helemano	30,000	1,900	22,900	34%	40,200	5,900	29,700	30%	40,200	5,900	28,300	24%
<i>Central Oahu</i>												
8. Waikakalua	128,700	4,900	85,800	40%	180,300	14,100	116,400	36%	180,300	14,200	98,500	12%
9. Kipapa	144,700	6,400	99,200	44%	208,000	21,400	134,600	36%	208,000	21,500	133,100	34%
10. Lumialua	195,900	7,800	122,400	59%	310,900	35,200	185,600	52%	310,900	36,100	162,200	33%
<i>PUC Corridor</i>												
11. Kalaueo	430,000	24,300	280,500	40%	601,100	103,000	356,700	23%	601,100	103,600	334,500	15%
12. Moanalua	469,900	34,400	323,500	16%	547,300	108,900	338,400	5%	547,300	109,500	318,100	-2%
13. Kapalama	523,500	48,600	380,100	29%	676,400	125,200	423,000	17%	676,400	126,500	406,300	13%
14. Nuuanu	599,100	59,700	414,800	20%	721,400	137,200	486,800	17%	721,400	138,300	468,200	13%
15. Ward	466,800	61,700	331,200	33%	623,000	126,700	418,300	26%	623,000	127,600	405,200	22%
16. Manoa-Palolo	542,800	56,700	396,000	23%	688,700	83,100	490,500	24%	688,700	83,800	460,100	19%
17. Beretania/King	476,000	77,400	328,100	33%	631,600	145,900	421,800	29%	631,600	142,200	381,900	16%
<i>East Honolulu</i>												
18. Kapakahi	103,200	6,500	76,600	30%	133,700	18,200	94,900	24%	133,700	18,300	90,900	19%
19. Niu	73,000	4,500	55,800	31%	95,300	14,300	69,600	25%	95,300	14,400	68,100	18%
20. Makapuu Point	5,700	300	4,500	46%	8,300	1,200	6,600	47%	8,300	1,200	5,900	31%
<i>Windward Oahu</i>												
21. Trans-Koolau	159,300	12,800	107,700	33%	211,100	22,800	137,600	28%	211,100	22,900	128,900	20%
22. Quarry	127,500	7,600	80,000	24%	158,400	10,800	98,200	23%	158,400	10,700	96,800	21%
23. Kailua	49,500	3,900	32,500	12%	55,200	6,000	41,000	26%	55,200	6,000	38,400	16%
24. Kawaunuli	94,800	3,600	66,400	29%	122,400	6,500	82,500	24%	122,400	6,100	70,200	9%
25. Likelike	114,900	5,600	81,000	22%	139,600	11,000	95,700	18%	139,600	11,100	91,200	13%
26. Kualoa	15,200	1,500	11,300	28%	19,500	3,100	14,600	29%	19,500	3,100	13,500	19%

Notes:

- Total person and transit person trips are resident trips only (not including visitor trips).
- Vehicle trips are total, including resident trips, visitor trips, and commercial vehicle adjustment.

TABLE 2-7
AM PEAK HOUR TRAVEL FORECASTS BY SCREENLINE
OAHU REGIONAL TRANSPORTATION PLAN

Corridor/ Screenline	1980 BASE MODEL					2020 BASELINE SCENARIO					2020 WITH PLAN SCENARIO				
	NB/WB Vehicle Trips	SB/EB Vehicle Trips	Total Vehicle Trips	Change from 1980	%	NB/WB Vehicle Trips	SB/EB Vehicle Trips	Total Vehicle Trips	Change from 1980	%	NB/WB Vehicle Trips	SB/EB Vehicle Trips	Total Vehicle Trips	Change from 1980	%
<i>Ewa/Waianae</i>															
1. Maillili	790	1,190	1,980			1,480	1,560	3,040	54%		1,380	1,420	2,810	42%	
2. Kahe Point	1,100	1,910	3,010			2,230	3,150	5,380	79%		2,080	2,980	4,940	64%	
3. Ewa	1,390	2,660	4,050			5,420	6,040	11,460	183%		4,930	5,620	10,550	160%	
4. Waikale	3,450	6,240	9,690			7,280	9,480	16,730	73%		6,610	8,700	15,300	58%	
5. Farrington	2,030	1,910	3,940			4,290	4,890	9,180	139%		3,940	4,490	8,440	120%	
<i>North Shore</i>															
6. Waimea	280	420	700			370	670	1,040	49%		350	610	960	37%	
7. Helemano	550	1,150	1,700			720	1,350	2,070	22%		680	1,280	1,920	13%	
<i>Central Oahu</i>															
8. Waikakalaua	2,100	3,820	5,910			3,100	5,440	8,540	45%		2,350	4,130	6,480	10%	
9. Kipapa	2,340	5,590	7,930			2,970	7,550	10,520	33%		2,740	6,610	9,350	18%	
10. Lumiala	2,510	7,020	9,530			3,760	9,420	13,180	38%		3,580	9,240	12,830	35%	
<i>PUC Corridor</i>															
11. Kaluao	6,220	14,130	20,350			8,090	15,670	23,760	17%		7,580	14,330	21,910	8%	
12. Moanalua	9,090	15,000	24,090			9,110	15,500	24,610	2%		8,410	14,270	22,680	-6%	
13. Kapalama	9,990	17,770	27,760			10,810	20,320	31,130	12%		10,030	19,200	29,230	5%	
14. Nuuanu	11,400	19,450	30,850			12,500	22,500	35,010	13%		11,700	21,250	32,950	7%	
15. Ward	12,180	10,500	22,680			16,570	13,180	29,750	31%		15,630	12,470	28,090	24%	
16. Manoa-Palolo	15,980	11,090	26,970			18,830	13,450	32,280	20%		17,420	12,680	30,070	11%	
17. Beretania/King	10,450	16,960	27,410			14,280	20,460	34,750	27%		12,510	18,560	31,070	13%	
<i>East Honolulu</i>															
18. Kapakahi	5,280	1,420	6,710			6,510	1,790	8,300	24%		6,060	1,730	7,790	18%	
19. Niu	3,850	980	4,820			4,470	1,280	5,750	20%		4,190	1,250	5,420	12%	
20. Makapuu Point	170	110	280			300	120	420	50%		250	110	360	29%	
<i>Windward Oahu</i>															
21. Trans-Koolau	7,520	2,060	9,570			8,830	2,680	11,510	20%		8,000	2,510	10,510	10%	
22. Quarry	4,600	1,680	6,280			5,660	1,980	7,650	22%		5,190	1,860	7,050	12%	
23. Kaliua	1,530	680	2,210			2,100	810	2,910	32%		2,030	730	2,760	25%	
24. Kawaunui	2,130	1,950	4,070			2,920	2,290	5,210	28%		2,630	1,840	4,470	10%	
25. Likelike	1,500	4,220	5,720			1,910	4,640	6,550	15%		1,790	4,290	6,080	8%	
26. Kualoa	230	440	670			290	540	820	22%		270	490	760	13%	

daily person and daily vehicle trips, however, are the Maililiili, Kahe Point, Ewa, Waikele, and Farrington screenlines in the Ewa/Waianae corridor and the Kipapa and Lumiaina screenlines in Central Oahu. These findings correlate with the projected socioeconomic growth in the PUC, Ewa and Central Oahu areas.

Table 2-6 also indicates that daily transit person trips are projected to increase at a significant rate from 1990 to 2020 at all of the screenlines, with the largest absolute increases in transit trips projected to occur across the screenlines within the PUC. Significant increases in transit trips are also projected at the Ewa, Waikele, and Farrington screenlines in the Ewa/Kapolei area and the Kipapa and Lumiaina screenlines in Central Oahu. The projected increases in transit ridership result from implementation of the various improvements and strategies contained in the Transit and TDM Elements of the plan.

When compared to the daily forecasts in Table 2-6, a review of the results displayed in Table 2-7 show that vehicle trips during the AM peak hour are generally projected to increase at a slightly lesser rate than the daily trips, due to the concentrated effect of the increased transit tripmaking and home-to-work average vehicle occupancies during peak periods. Nonetheless, the increases in AM peak hour vehicle trips are still projected to be substantial at many of the screenlines.

Deficiency Analysis

Travel conditions for the 26 screenlines are represented using volume/capacity (V/C) ratios and levels of service (LOS). Level of service definitions are presented in Table 2-8. Typically, levels of service A through D are considered to be acceptable conditions, while levels of service E (approaching capacity) and F (over capacity) are considered to be unsatisfactory.

Base Year Existing Conditions. Congested operating conditions are prevalent during the morning and afternoon peak hours on major highways in the Honolulu area. A prime example is Interstate H-1 from the Waiawa Interchange to the University area, where stop-and-go traffic conditions are typical. Many signalized routes, like Nimitz Highway and Dillingham Boulevard in the Iwilei area, Nimitz Highway/Ala Moana Boulevard in the downtown area, sections of King and Beretania Streets, and Piikoi Street leading to Interstate H-1 (to name a few), are heavily

TABLE 2-8
LEVEL OF SERVICE DEFINITIONS FOR ARTERIAL STREET SEGMENTS

Level of Service	Volume/Capacity Ratio	Definition
A	0.00 - 0.60	EXCELLENT. Primarily free-flow conditions at about 90 percent of free-flow speed. Vehicles are completely free to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.
B	0.61 - 0.70	VERY GOOD. Reasonably unimpeded flow at about 70 percent of free-flow speed. Ability to maneuver is only slightly restricted and delay at intersections is not bothersome.
C	0.71 - 0.80	GOOD. Stable operations at about 50 percent of free-flow speed. Ability to maneuver and change lanes may be restricted at mid-block locations. Motorists will begin to experience tension while driving.
D	0.81 - 0.90	FAIR. Small increases in flow begin to cause substantial increases in intersection approach delay. Ability to maneuver becomes more difficult, with speeds about 40 percent of free-flow speed.
E	0.91 - 1.00	POOR. Characterized by significant delays at intersection approaches and travel speeds about one-third of free-flow speed. Ability to maneuver is severely restricted and driver tension is high.
F	>1.00	FAILURE. Extremely low travel speeds and unstable traffic flow. Characterized by long delays at intersection approaches, severe difficulty in maneuvering between lanes, and extremely high driver tension.

Source: Adapted from Transportation Research Board, *Highway Capacity Manual, Special Report 209*, 1985.

congested, typified by requiring more than one traffic signal cycle to clear intersections during peak periods.

Table 2-9 summarizes the results of the LOS analysis for the major roadways crossing the various screenlines during AM peak hour in the peak inbound direction (i.e., towards Honolulu). The screenline level of service analysis indicates that the worst traffic conditions are currently experienced at the Kalauao, Kapalama, and Nuuanu screenlines in the PUC, the Kapakahi and Niu screenlines in East Honolulu, and the Trans-Koolau and Likelike screenlines in Windward Oahu. Each of these screenlines were estimated to operate at LOS E or F during the AM peak hour in the 1990 base year.

2020 Baseline Conditions. Under Year 2020 baseline conditions (assuming implementation of baseline improvements), it is projected that the Kahe Point, Lumiaina, Ward, and Kailua screenlines would be added to the list of locations operating at LOS E or F, while operating conditions are also projected to degrade substantially at the Waikele, Kipapa, Manoa-Palolo, Beretania/King, and Kawainui screenlines. The Trans-Koolau screenline is projected to improve from LOS F to LOS E, due to the additional capacity resulting from completion of H-3. Eleven of the 26 screenlines are projected to operate at LOS E or F.

2020 Conditions With Plan. Implementation of the Oahu Regional Transportation Plan would result in both increased highway capacity and reductions in vehicle travel due to the proposed transit system improvements and transportation demand management measures. With implementation of the plan, Table 2-9 indicates that poor levels of service (LOS E or F) are projected to remain at the Kapalama, Nuuanu, and Ward screenlines in the PUC, and at the Kapakahi and Niu screenlines in East Honolulu. However, each of the 21 remaining screenlines are projected to operate at LOS D or better with implementation of the plan.

TABLE 2-9
LEVEL OF SERVICE ANALYSIS AT SCREENLINES, AM PEAK HOUR INBOUND
OAHU REGIONAL TRANSPORTATION PLAN

CORRIDOR/ SCREENLINE	1980 BASE MODEL				2020 BASELINE SCENARIO				2020 WITH PLAN SCENARIO			
	VEHICLE VOLUME	CAPACITY	RATIO	LOS	VEHICLE VOLUME	CAPACITY	RATIO	LOS	VEHICLE VOLUME	CAPACITY	RATIO	LOS
<i>Ewa/Waianae</i>												
1. Mailili	1,180	2,560	0.46	A	1,560	2,560	0.61	B	1,420	2,560	0.55	A
2. Kahe Point	1,910	2,560	0.75	C	3,150	2,560	1.23	F	2,880	3,840	0.75	C
3. Ewa	2,680	8,350	0.32	A	6,040	10,710	0.56	A	5,620	11,690	0.48	A
4. Waikale	6,230	10,300	0.60	B	9,460	11,080	0.85	D	8,700	12,820	0.68	B
5. Farrington	1,810	6,950	0.26	A	4,890	7,700	0.64	B	4,490	8,530	0.53	A
<i>North Shore</i>												
6. Waimea	420	970	0.43	A	670	970	0.69	B	610	970	0.63	B
7. Helemano	1,150	1,940	0.59	A	1,350	1,940	0.70	B	1,260	1,940	0.65	B
<i>Central Oahu</i>												
8. Waikakalua	3,920	7,430	0.51	A	5,440	7,430	0.73	C	4,130	10,350	0.40	A
9. Kipapa	5,600	7,780	0.72	C	7,550	8,770	0.86	D	6,610	13,080	0.51	A
10. Lumiaia	7,020	9,130	0.77	C	9,420	10,110	0.93	E	9,240	11,810	0.78	C
<i>PUC Corridor</i>												
11. Kalatiao	14,130	14,960	0.94	E	15,670	16,910	0.93	E	14,330	16,910	0.85	D
12. Moanalua	15,000	18,990	0.79	C	15,500	20,940	0.74	C	14,270	20,940	0.68	B
13. Kapalama	17,770	14,820	1.20	F	20,320	17,000	1.20	F	19,200	17,330	1.11	F
14. Nuuanu	19,450	17,340	1.12	F	22,500	17,340	1.30	F	21,250	17,340	1.23	F
15. Ward	12,180	13,980	0.88	D	16,570	15,780	1.05	F	15,630	16,780	0.99	E
16. Manoa-Palolo	15,980	20,540	0.77	C	18,830	22,070	0.85	D	17,420	22,070	0.79	C
17. Beretania/King	16,960	23,120	0.73	C	20,460	23,900	0.86	D	18,580	24,730	0.75	C
<i>East Honolulu</i>												
18. Kapakahi	5,280	3,200	1.65	F	6,510	3,200	2.03	F	6,080	4,200	1.44	F
19. Niu	3,850	2,700	1.43	F	4,470	2,700	1.66	F	4,180	3,200	1.30	F
20. Makapuu Point	170	970	0.18	A	300	970	0.31	A	250	970	0.26	A
<i>Windward Oahu</i>												
21. Trans-Koolau	7,520	5,800	1.30	F	8,830	9,700	0.91	E	8,000	9,700	0.82	D
22. Quarry	4,600	7,080	0.65	B	5,660	7,080	0.80	C	5,180	8,030	0.65	B
23. Kailua	1,530	1,750	0.87	D	2,100	1,750	1.20	F	2,030	2,700	0.75	C
24. Kawaiulu	2,130	3,250	0.66	B	2,920	3,250	0.90	D	2,630	4,200	0.63	B
25. Likelike	4,220	3,060	1.38	F	4,640	3,890	1.19	F	4,280	4,770	0.90	D
26. Kualoa	440	970	0.45	A	540	970	0.56	A	490	970	0.51	A

Notes:
V/C Ratio = Volume/Capacity Ratio.
LOS = Level of Service.

III. HIGHWAY ELEMENT

Freeways, highways and streets are basic transportation network elements responsible for the movements of people and goods on Oahu. The highway network is utilized by all types of vehicles, public and private transit services, bicycles, and pedestrians.

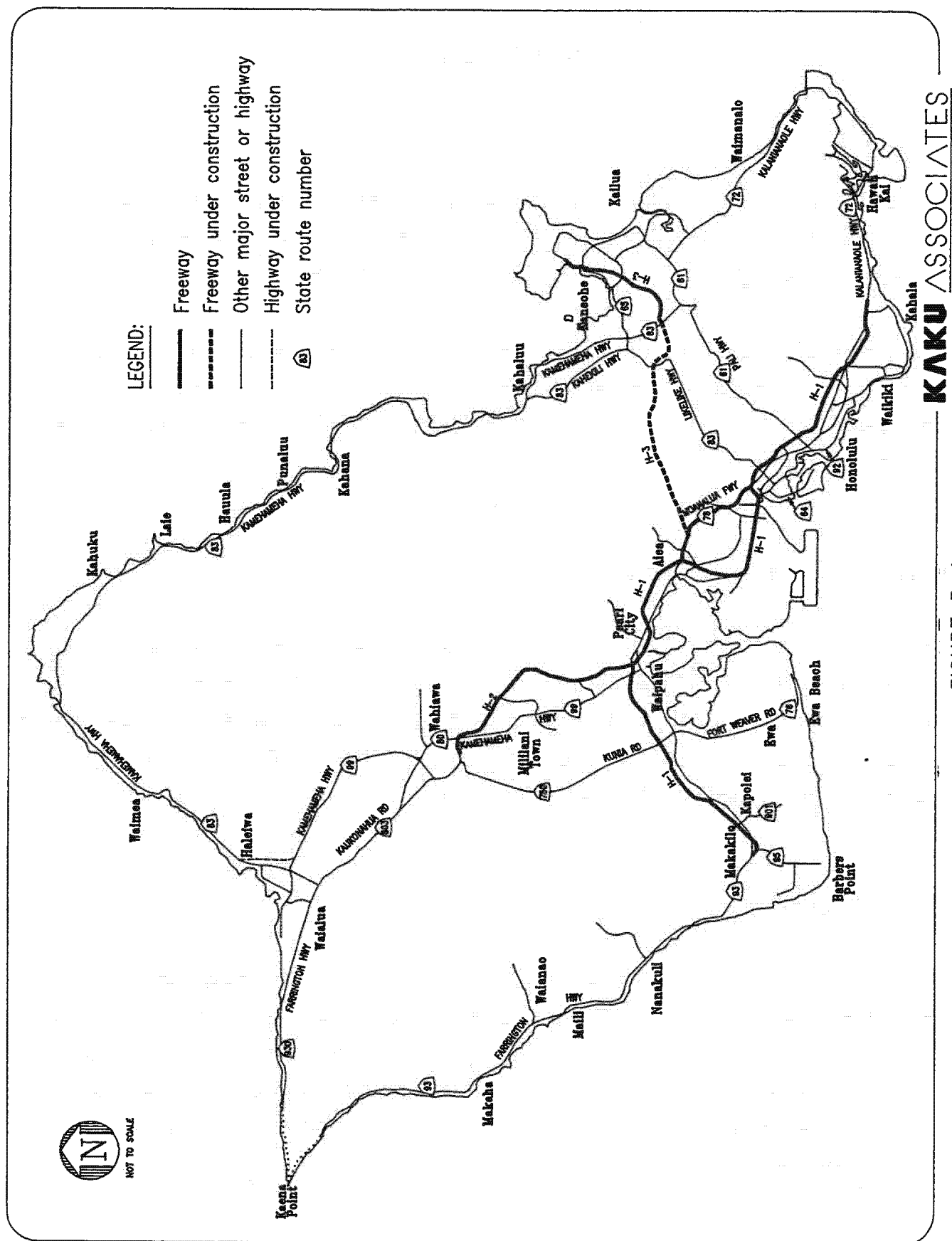
This chapter describes the existing street and highway system on the island of Oahu, discusses various issues concerning improvements to the street and highway system, and presents the improvements and programs comprising the Highway Element of the Oahu Regional Transportation Plan.

EXISTING HIGHWAY SYSTEM

The roadway system on Oahu is maintained by the State of Hawaii Department of Transportation and the City and County of Honolulu Departments of Transportation Services and Public Works. The State highway system includes all freeways and major highways connecting various parts of the island. The City and County street system consists of the remainder of the roadways on the island, including both arterial streets and local streets.

State Highway System

The State Highway system currently consists of approximately 44 miles of freeway and about 200 miles of major highways. Figure 3-1 illustrates the existing highway system serving the island. The street network and development patterns in Oahu are heavily constrained by topography. Because of these physical constraints, roadways are primarily located in the coastal areas between the mountains and ocean. The dominant highways generally parallel the coastline and carry Ewa/Koko Head traffic.



**FIGURE 3-1
EXISTING HIGHWAY SYSTEM**

There are four existing state freeways: Interstate H-1 accommodates traffic between Waianae and Kahala; Interstate H-2 serves traffic between Mililani/Wahiawa and Pearl City; a short section of Interstate H-3 connects Kaneohe Marine Corps Air Station to Kamehameha Highway in Windward Oahu; and the Moanalua Freeway (Highway 78) connects H-1 and Kamehameha Highway in Aiea with H-1 at the Kahauiki Interchange. In addition, the extension of the Interstate H-3 Freeway across the Koolau Mountains to the Halawa Interchange is currently under construction.

In addition to the freeways, a number of major highways connect the various parts of the island. Pali Highway and Likelike Highway connect Honolulu with Windward Oahu across the Koolau Mountains. Kalanianaʻole Highway encircles the eastern tip of Oahu, serving travel between Kahala and Hawaii Kai and continuing to Kailua. Farrington Highway serves the Leeward Coast. Kamehameha Highway connects Honolulu with Pearl City and Central Oahu (paralleling H-1 and H-2), and continues to encircle the North Shore of the island and the Windward Coast. In addition, the Haleiwa Bypass is currently under construction from Kamehameha Highway east of Weed Circle to Kamehameha Highway north of Haleiwa Beach Park.

There are also a number of state highways within the Primary Urban Center, which encompasses the area roughly from Pearl City to Kahala along the coastal zone between the Pacific Ocean and approximately five miles inland. These include Farrington Highway, Kamehameha Highway, Nimitz Highway, Ala Moana Boulevard, and Vineyard Boulevard in the Ewa/Koko Head direction; and Likelike Highway, Pali Highway, and portions of Puuloa Road, Kalihi Street, and Liliha Street in the mauka/makai direction.

City and County Street System

The City and County street system consists of those arterial facilities which are not in the State system plus local streets. The density of the street system is proportional to the level of development in the area. The majority of existing development on the island, and hence the most developed street system, lies within the Primary Urban Center. Figure 3-2 illustrates the street and highway network in the Primary Urban Center.

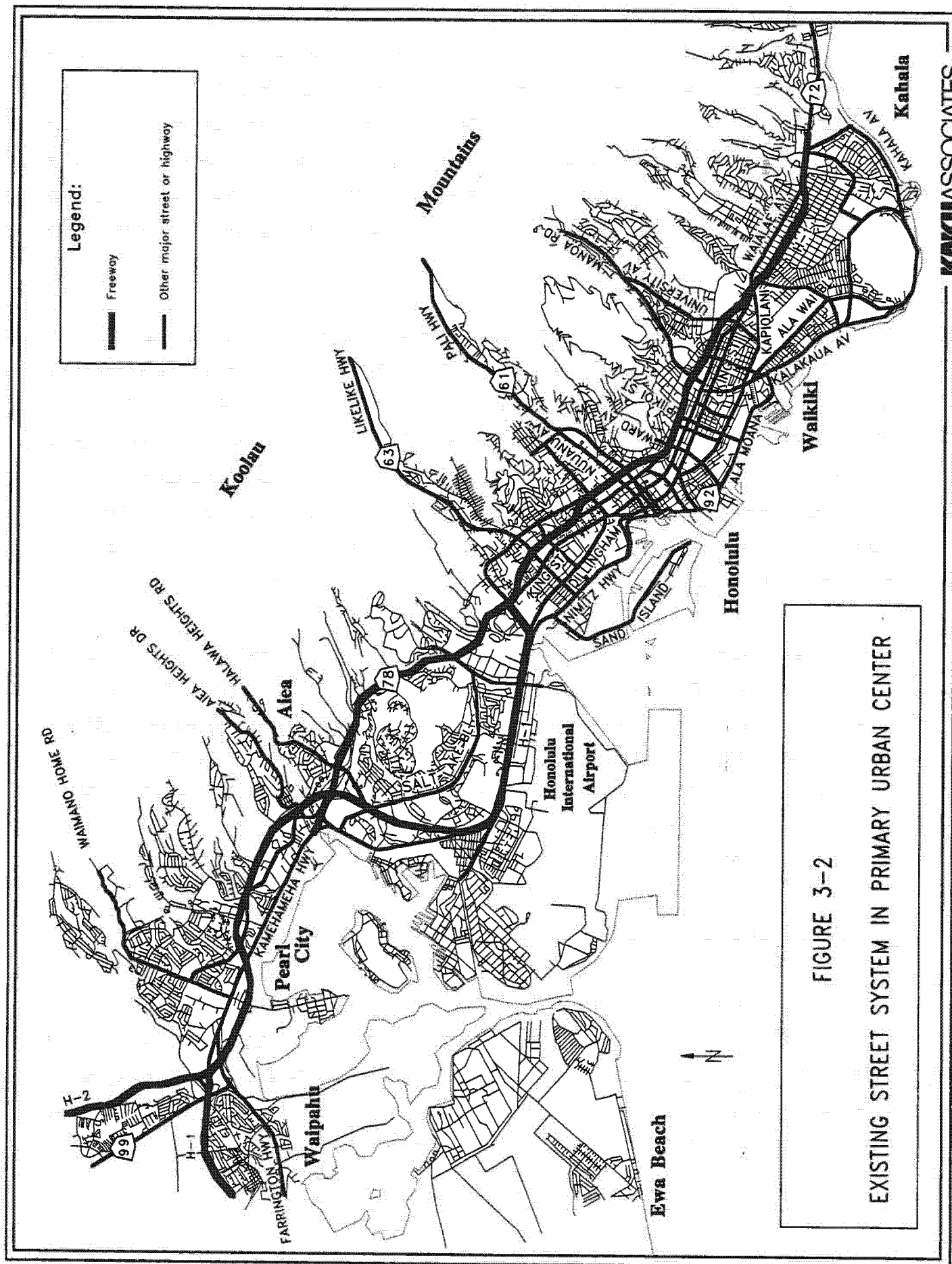


FIGURE 3-2

EXISTING STREET SYSTEM IN PRIMARY URBAN CENTER

In addition to the state highways discussed previously, the following streets are the principal Ewa/Koko Head arteries:

- Beretania Street
- Ala Wai Boulevard
- Moanalua Road
- Salt Lake Boulevard
- Dillingham Boulevard
- King Street
- School Street
- Kapiolani Boulevard
- Kuhio Avenue
- Kalakaua Avenue

The main mauka/makai roadways are:

- Puuloa Road
- Middle Street
- Kalihi Street
- Waiakamilo Road/Houghtailing Street
- Liliha Street
- Kapahulu Avenue
- South Street/Punchbowl Street
- Ward Avenue
- Piikoi Street/Pensacola Street
- Keeaumoku Street
- Kalakaua Avenue
- McCully Street
- University Avenue

Transportation System Management Measures

To better manage the transportation system in Oahu, high-occupancy vehicle (HOV) lanes and other traffic operational measures have been implemented. The goal of such transportation system management (TSM) measures is to increase the effective supply of the transportation system and to manage the demand more efficiently. The existing HOV system is described as part of the Transportation Demand Management element in Chapter V. Various traffic operational measures in use on Oahu to move traffic more efficiently include contraflow lanes, freeway shoulder lanes, and centralized signal control.

Contraflow Lane Operations. Given the concentration of existing employment centers in the Primary Urban Center and the very imbalanced peak traffic flows which result, one of the most effective measures is the use of contraflow traffic lanes during peak commuting periods. Facilities that are currently operating with contraflow lane operations include:

- Kapiolani Boulevard - During the morning peak period, one eastbound lane is reversed to provide a fourth westbound travel lane from the H-1 Freeway near South King Street

to Ewa of Ward Avenue. During the afternoon peak period, one westbound lane is reversed to provide a fourth eastbound travel lane from Ward Avenue to McCully Street.

- Waialae Avenue - During the afternoon peak period, one westbound lane is reversed to provide an additional eastbound travel lane from Kapahulu Avenue to between 7th and 8th Avenues.
- Ward Avenue - A mauka-direction lane is reversed to provide a third makai-direction travel lane from Lunalilo Street to Beretania Street in the morning peak period.
- Kahekili Highway - During the morning peak period, the center left-turn lane operates as an additional inbound lane from Haiku Road to Likelike Highway. During the afternoon peak period, the center left-turn lane is reversed in this segment to provide an additional outbound lane.
- Kalanianaʻole Highway - A Kokohead-direction lane is reversed to provide a third Ewa-direction travel lane between Keahole Street and East Halemaumau Street during the morning peak period. Upon the completion of the current project to widen this roadway from four to six lanes, this contraflow operation will cease.

Freeway Shoulder Lanes. The shoulder along Interstate H-1 is used to provide an additional travel lane during the morning peak period in the Kokohead direction between the Kunia Interchange and the Paiwa Interchange, between the Waiawa Interchange and the Waiiau Interchange off-ramp, and again between the Waiiau Interchange on-ramp and the Halawa Interchange off-ramp.

Centralized Signal Control System. The City and County of Honolulu operates a centralized traffic signal monitoring and control system to better manage and coordinate traffic flows on the arterial street system. At present, the system encompasses about 375 of the approximately 620 total signalized intersections on the island. Approximately 120 additional intersections are programmed to be added to the system in the next phase of its implementation.

ISSUES

The Highway Element of the ORTP was developed with consideration given to a variety of issues which affect the future street and highway system on Oahu. These issues included the plan's multi-modal approach to providing congestion relief, the need to preserve right-of-way for plan

improvements, and developer contributions to the funding of plan improvements serving development areas.

Congestion Relief

A key issue addressed during development of the ORTP was the question of whether congestion relief is more appropriately attained through major physical highway capacity improvements, through transportation systems management measures to more efficiently utilize existing street capacity, or through increased efforts to reduce travel demands via transit system enhancements and transportation demand management measures to encourage ridesharing or alternative modes.

The philosophy underlying the ORTP is that none of these approaches can effectively address the issue by itself. Given the topography and dense development, major new highway capacity improvements are difficult to implement within the PUC. However, capacity improvements are appropriate in the developing areas of the island which do not yet have established street system infrastructure and development patterns, and in other areas where feasible. TSM measures to move traffic efficiently, such as one-way streets and incident management, are necessary but not sufficient. Transit improvements and TDM are each also important components of the overall multi-modal approach to the future transportation system embodied in the ORTP.

Protection of Future Highway Right-of-Way

Many of the planned highway widening and new highway construction projects contained in the ORTP require acquisition of right-of-way. As projects are carried further through the project development process, studies should be undertaken to determine the precise right-of-way requirements as early as possible and steps taken to acquire and/or preserve the necessary right-of-way from development. Prior to the actual right-of-way purchase, the ORTP projects should be approved in the appropriate Development Plan Public Facilities Map. Additional steps will need to be taken to ensure that development projects are required to dedicate the necessary

right-of-way (and possibly construct partial roadways or widenings), or at the least are required to refrain from constructing buildings within the future right-of-way corridor.

Developer/Other Funding

The ORTP identifies a number of projects which could be partially or wholly funded by private or public sector developers. These consist of projects which would be constructed solely to provide access to or within a particular developing area, and projects to mitigate the anticipated impacts of future development that would also benefit other existing or future traffic. The identified projects are located in either the Ewa/Kapolei or Central Oahu growth areas, or in the Kakaako redevelopment area, and are listed in Appendix D. Issues regarding the potential level of developer participation and methods of financing are discussed further in Chapter VI.

Ongoing Subregional Transportation Planning Efforts

A number of subregional or corridor-level transportation planning studies are either currently or soon to be underway whose findings will not be available in time for inclusion in the ORTP. For example, the Likelike Highway Traffic Improvement Study, encompassing the area from Valley View to H-1, is intended as an effort to identify a long-term solution to deficiencies in the Trans-Koolau corridor. Funding is allocated for this study in the current Oahu TIP. The Waikiki Regional Traffic Impact Plan, currently being prepared for the City and County Department of Transportation Services, will evaluate and recommend access improvements to/from Waikiki and circulation system improvements within Waikiki. Recommendations of these studies can be incorporated into a future update of the ORTP.

HIGHWAY PLAN

The Highway Element of the Oahu Regional Transportation Plan includes both major highway improvements and transportation systems management measures. Major highway improvements consist of physical improvements intended to increase the capacity of the highway system, such

as roadway widenings, interchange improvements, and construction of new facilities. TSM measures are operational improvements intended to improve the operating efficiency or safety of the highway system, and include measures such as contraflow or reversible lanes, one-way streets, channelization, and incident management.

Tables 3-1, 3-2 and 3-3 list the improvement projects comprising the Highway Element. Tables 3-1 and 3-2 describe State highway system projects and City and County street system projects, respectively, while Table 3-3 lists a separate highway improvement project to be constructed by the Federal government. The tables also indicate the total estimated capital cost to implement each project, in 1994 dollars. Figures 3-3 through 3-6 illustrate the locations of the highway projects by area.

As indicated in the tables, the highway projects are divided into three time periods, corresponding to the period in which construction of the project is to be completed: 1995 to 2000; 2001 to 2005; and 2006 to 2020. The assignment of projects to the different periods reflects a number of factors, including the current status of the project (if already in planning, design or construction stages), the projected need for the project, the relative ease or difficulty of project implementation, and projected revenue availability.

It should be recognized that the project limits and alignments indicated in the plan are conceptual and intended for planning purposes only. Precise project limits and alignments, as well as refined cost estimates, will be developed through future detailed design and environmental studies as the individual projects progress through the planning and design process.

Key components of the Highway Element include:

- New Highway Construction - New highway construction projects include such projects as completion of H-3, street extensions in the Kakaako area, construction of new roadways in the Ewa/Kapolei area identified in the Ewa Master Plan, construction of the Nimitz Highway Viaduct, and construction of a new Central Mauka Road and Central East-West Road in Central Oahu to support projected Year 2020 development levels.
- Interchange Improvements - Various interchange improvements, such as new or widened ramps, are planned at a number of existing interchanges along H-1 and H-2. New freeway interchanges are planned in the Ewa and Central Oahu areas. New arterial interchanges are also planned at Castle Junction and on Likelike Highway at Kahekili Highway.

- **Roadway Widenings** - Street and highway widenings are planned for a number of locations around the island.
- **Safety Improvements** - A number of safety improvements are planned, such as provision of a Waianae Coast mauka emergency access route, safety improvements to Farrington Highway, and realignment of Kaukonahua Road.
- **Operational Improvements** - A variety of operational improvements are included in the plan, such as contraflow operations on Kahekili Highway and a Queen Street/Pohukaina Street one-way couplet (with extensions).
- **Incident Management** - Implementation of incident management measures to be recommended through the upcoming intelligent transportation system (ITS) study. This study, to be conducted by the City Department of Transportation Services, is intended to identify, evaluate, and recommend potential applications of ITS technology on Oahu. Potential implementation costs cannot be estimated until such time as the measures are identified. However, as a placeholder, an allocation of \$4.0 million (in 1994 dollars) has been set aside in the ORTP for incident management.

**TABLE 3-1
HIGHWAY ELEMENT, STATE SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN**

Map #	Facility	Location	Description	Estimated Cost [a]
STATE PROJECTS: 1995-2000				
S27.	Interstate H-1	Kapolei Interchange	Construct new interchange per Ewa Master Plan	\$19.0M [b]
S1.	Interstate H-1*	Kunia Interchange	Improve interchange: • Widen EB on-ramp to 3 lanes • Relocate existing WB on-ramp & construct new 2-lane WB to SB loop off-ramp • Widen Fort Weaver Rd to add 1 SB lane from loop ramp to Farrington Hwy • Widen Kunia Rd to divided 4 lane plus NB auxiliary lane from H-1 to Kupuna Loop	\$8.2M
S2.	Interstate H-1	Makakilo Interchange	Improve existing interchange per Ewa Master Plan	\$4.0M [b]
S4.	Interstate H-1*	Pali Hwy eastbound off-ramp	Add 3rd lane to existing off-ramp to increase storage at signal (under construction)	n/a [a]
S5.	Interstate H-2*	Mililani Interchange	Improve interchange: • Relocate existing SB off-ramp • Construct new WB to SB loop on-ramp	\$7.2M [b]
S6.	Interstate H-2*	Waipio Interchange	Improve interchange: • Construct new WB to SB loop on-ramp • Widen existing NB off-ramp • Widen Ka Uka BI bridge	\$16.0M [b]
S7.	Interstate H-3*	Halawa Interchange to Kamehameha Hwy	New 4-lane freeway (under construction)	n/a [a]
S8.	Farrington Hwy*	Ala Hema St toward Jade St	Widen to 4 lanes (under construction)	\$5.6M [a]
S9.	Farrington Hwy	Nanakuli, Maili, Waianae, Makaha	Safety & operational improvements (e.g., sidewalks, signalized pedestrian crosswalks or bridges, continuous left-turn lanes)	\$21.5M
S10.	Fort Barrette Rd	H-1 to Kapolei Pkwy	Widen to 4 lanes per Ewa Master Plan	\$7.0M [b]
S11.	Kahekili Hwy*	Likelike Hwy to Haiku Rd	Widen to 6 lanes from Likelike Hwy to Kahuhipa St; widen to 5 lanes (3 inbound & 2 outbound) from Kahuhipa St to Haiku Rd (under construction)	\$3.6M [a]
S13.	Kamehameha Hwy*	Waipio Uka St to Ka Uka BI	Widen to 4 lanes	\$5.2M [a]
S23a.	Kunia Rd	H-1 Kunia Interchange to Royal Kunia	Widen Kunia Rd to 4 lanes; widen H-1 Kunia IC NB off-ramp to 2 lanes	\$5.5M [b]

TABLE 3-1 (continued)
HIGHWAY ELEMENT, STATE SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
S25.	Nimitz Hwy Viaduct*	Keehi Interchange to Awa Street	<ul style="list-style-type: none"> Construct 2-lane viaduct from Keehi Interchange to Pacific St (1 lane HOV & 1 lane general purpose) Reversible operation (2 lanes inbound in AM peak, 2 lanes outbound in PM peak) Widen inbound Nimitz Hwy from Pacific St to Awa St to provide left-side HOV lane at-grade 	\$197.6M + \$0.25M/yr ops
S14.	Pali Hwy*	Castle Junction	Construct interchange	\$28.0M
S15.	Puuloa Rd*	Kamehameha Hwy to Salt Lake Bl	Widen to 4 lanes	\$9.4M [a]
S16.	Sand Island Parkway*	Sewage Treatment Plant to Sand Island Park	Widen to 4 lanes (under construction)	\$3.8M [a]
S26.	Ward Av	Ala Moana Bl to Keawe St	Extend Ward Av to Keawe St via Ilalo St (HCDA project)	\$40.1M [b]
S43.	Incident management	Major freeways and highways	Implementation of incident management measures to be determined through ITS study	\$3.0M
STATE PROJECTS: 2001-2005				
S3.	Interstate H-1*	Middle St to Kapiolani Interchange	Operational & safety improvements	\$7.0M
S17.	Interstate H-1	Palailai Interchange	Improve existing interchange per Ewa Master Plan	\$3.1M [b]
S18.	Interstate H-1	Waiawa Interchange	Improvements to relieve congestion at interchange	\$7.3M
S19.	Ewa North-South Rd*	H-1 to Papipi Rd	New mauka-makai roadway & interchange with H-1 per Ewa Master Plan	\$24.5M [b]
S20.	Fort Weaver Rd/Kunia Rd	H-1 to Renton Rd	Widen to 6 lanes per Ewa Master Plan	\$16.1M [b]
S33.	Kahekili Hwy*	Likelike Hwy Interchange	Construct interchange	\$56.3M
S21.	Kalaeloa Bl corridor	H-1 to business/industrial park	Provide 7 to 8 lanes in corridor per Ewa Master Plan	\$15.5M [b]
S22.	Kalaniana'ole Hwy	Kailua Rd to Castle Junction	Widen to 6 lanes	\$39.0M
S38.	Kamehameha Hwy	Castle Junction to H-3	Widen to 6 lanes	\$6.5M
S23b.	Kunia Rd	H-1 to Royal Kunia	Widen to 6 lanes	\$11.0M [b]
S24.	Sand Island Access Rd	Auiki St to Nimitz Hwy	Widen to 6 lanes	\$3.8M

TABLE 3-1 (continued)
HIGHWAY ELEMENT, STATE SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
S43.	Incident management	Major freeways and highways	Continued implementation of incident management measures to be determined through ITS study	\$1.0M
STATE PROJECTS: 2006-2020				
S28.	Interstate H-1*	University Av Interchange	Improve interchange: • Construct new ramps to allow all movements • Safety improvements	\$18.0M
S29.	Interstate H-2	H-2 between Mililani Interchange & Waipio Interchange	New interchange serving area mauka of H-2 s/o Kipapa Gulch [c]	\$19.0M [b]
S30.	Interstate H-2	H-2 between Waiawa Interchange & Waipio Interchange	New interchange serving Waipio Mauka/Gentry area [c]	\$19.0M [b]
S31.	Farrington Hwy	H-1 terminus in Kapolei to Nanakuli	Widen to 6 lanes	\$27.5M [b]
S32.	Farrington Hwy Interchanges	Makaiwa Hills interchanges	Construct new interchanges	\$38.0M [b]
S12.	Kahekili Hwy	Likelike Hwy to Haiku Rd	• Enlarge baseline widening project (#S11a) to provide 6 lanes to Haiku Rd • Peak contraflow operation (i.e., 4 inbound & 2 outbound in AM)	\$1.5M + \$0.25M/yr ops
S34.	Kalaniana'ole Hwy	Keolu Dr to Kailua Rd	Widen to 6 lanes	\$12.0M
S35.	Kalaniana'ole Hwy	Laukahi St to Kilauea Av off-ramp	Add 1 lane WB	\$20.1M
S36.	Kalaniana'ole Hwy	Waimanalo Beach Park to Saddle City	Widen to 4 lanes	\$42.0M
S37.	Kamakee St*	Ala Moana Bl to Kapiolani Bl	Acquire 20' additional R/W & widen to 4 lanes (HCDA)	\$18.0M [b]
S39.	Kamehameha Hwy	Ka Uka Bl to Lanikuhana Av	Widen to 4 lanes (include pedestrian walkway on widened bridge over Kipapa Gulch)	\$35.0M
S40.	Kunia Rd	Royal Kunia to Schofield	Widen to 4 lanes	\$40.5M [b]
S41.	Likelike Hwy	Kamehameha Hwy to Kahekili Hwy	Widen to 6 lanes	\$11.5M

TABLE 3-1 (continued)
HIGHWAY ELEMENT, STATE SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
S42.	Queen St & Pohukaina St*	Punchbowl St to Pensacola St	<p>Street extensions for one-way couplet (HCDA project):</p> <ul style="list-style-type: none"> • Queen St extended from Kamakee St to Pensacola St, curving mauka to intersect Waimanu St opposite Pensacola St • Pohukaina St extended to Ward Av; Auahi St Waikiki of Ward Av aligned with Pohukaina St extension; Pohukaina St/Auahi St extended & curved mauka to merge with Queen St extension makai of Pensacola St • 3 Ewa-bound lanes on Queen St; 3 Waikiki-bound lanes on Pohukaina St/Auahi St 	\$4.5M [b]

Notes:

- * Denotes baseline project.
- a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction. For projects currently underway, represents estimated remaining unencumbered cost to complete (i.e., does not include awarded, obligated or spent funds).
- b. Improvement could be partially or fully funded by developers.
- c. Need for new H-2 interchanges may not arise if development and traffic growth in Central Oahu occurs as per current developer plans and traffic studies. Need arises if buildout of Planning Department Year 2020 socioeconomic projections for Central Oahu occurs, which represents substantially greater development than indicated in current plans.

**TABLE 3-2
HIGHWAY ELEMENT, CITY & COUNTY SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN**

Map #	Facility	Location	Description	Estimated Cost [a]
CITY PROJECTS: 1995-2000				
C2.	Farrington Hwy*	Kalaheo Rd to Fort Weaver Rd	Widen to 4 lanes	\$26.0M [b]
C3.	Kalia Rd*	Ala Moana Bl to Saratoga Rd	Provide 2 additional lanes within new 84' R/W	\$19.0M
C4.	Kapiolani Bl*	Atkinson Dr to Hauoli St	Widen to 8 lanes & other improvements for Honolulu Convention Center	\$5.0M [b]
C5.	Kapolei Pkwy	Ko Olina to Ewa North-South Rd	Construct new road per Ewa Master Plan	\$37.0M [b]
C6.	Liliha St	H-1 to King St	Widen to 6 lanes	\$5.0M
C7.	Moanalua Rd*	Aiea Heights Dr to Aiea Interchange	Widen to 4 lanes	\$5.0M [a]
C8.	Philip St*	Kalakaua Av	Provide double left-turn lanes onto Kalakaua Av	n/a [a]
C9.	Salt Lake Bl*	Kahuapaani St to Ala Liliroi St	Widen to 4 lanes	\$18.6M
C10.	Waianae Coast Mauka Emergency Access Route	Nanakuli to Makaha, along alignment generally following Lualualei Naval Rd, Fence Rd, Waianae Homestead Rd, Plantation Rd, & new road mauka of Ala Hema St & Mahinaau Rd	Provide emergency access route by constructing new connecting sections (Fence Rd to Waianae Homestead Rd, Plantation Rd to Kaulawaha Rd mauka of Ala Hema St & Mahinaau Rd)	\$28.8M
C11.	Ward Av*	Beretania St to Kinau St	Widen to 5 lanes	\$1.5M
CITY PROJECTS: 2001-2005				
C12.	Kamehameha Hwy*	Haiku Rd to Ipuka St	Widen to 4 lanes	\$4.6M
C13.	Kaukonahua Rd*	Mauka of Thompson Corner	Minor safety improvements (realignment of horizontal curves)	\$0.6M
C14.	King St*	Middle St to Liliha St	Widen to 6 lanes	\$40.1M
C15.	Puuahale Rd*	Nimitz Hwy to Dillingham Bl	Widen to 4 lanes	\$16.0M
C27.	Waipahu St	Kamehameha Hwy to Waipahu Depot St	Widen to 4 lanes (Kamehameha Hwy to Paia St) and/or add turn lanes, bus pull-out lanes, etc.	\$15.0M
CITY PROJECTS: 2006-2020				
C16.	Alakea St*	Queen St to King St	Add one lane	\$1.4M
C17.	Auiki St*	Sand Island Access Rd to Nimitz Hwy	Widen to 4 lanes	\$3.8M
C18.	Central East-West Rd	Extension of Ka Uka Bl to Kunia Rd	New 4-lane east-west road	\$70.1M [b]

TABLE 3-2 (continued)
HIGHWAY ELEMENT, CITY & COUNTY SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
C19.	Central Mauka Rd	Mililani Mauka (or Leilehua Interchange) to Kamehameha Hwy stub at Waiawa (or Moanalua Rd extension); parallel to & mauka of H-2	New 4-lane north-south road (with connections to H-2 interchanges) [c]	\$160.0M [b]
C20.	Kailua Rd*	Hahani St to Wanaao Rd	Widen to 4 lanes	\$2.2M
C21.	Kamehameha Hwy*	Haleiwa	Add left-turn lanes on Kamehameha Hwy at Haleiwa Rd & Paalaa Rd	\$1.7M
C22.	Lusitana St & Punchbowl St*	Vicinity of Vineyard Bl	Lusitana/Punchbowl St one-way couplet: <ul style="list-style-type: none"> • 4 lanes mauka-bound on Alapai St to Lusitana St • 3 lanes mauka-bound on Lusitana St from Alapai St to existing H-1 WB on-ramp at Punchbowl St (at-grade intersection of Vineyard Bl & Lusitana St) • 3 lanes makai-bound on Punchbowl St makai of Lusitana St 	\$0.9M
C23.	McCully St*	Kapiolani Bl to King St	Widen to 5 lanes to provide a center left-turn lane	\$8.4M
C24.	McCully St*	Beretania St to Dole St	Widen overpass by 2 additional lanes & construct loop on-ramp from NB McCully St to existing WB H-1 on-ramp at Alexander St	\$22.5M
C25.	Mokauea St*	Nimitz Hwy to Dillingham Bl	Widen to 4 lanes	\$1.4M
C26.	Vicinity of University Av*	Kapiolani Bl to Ala Wai Bl	Construct new Ala Wai Canal bridge & connecting roadway section; 2 one-way mauka-bound lanes on each	\$4.7M

Notes:

- * Denotes baseline project.
- a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction. For projects currently underway, represents estimated remaining unencumbered cost to complete (i.e., does not include awarded, obligated or spent funds).
- b. Improvement could be partially or fully funded by developers.
- c. Need for Central Mauka Road may not arise if development and traffic growth in Central Oahu occurs as per current developer plans and traffic studies. Need arises if buildout of Planning Department Year 2020 socioeconomic projections for Central Oahu occurs, which represents substantially greater development than indicated in current plans.

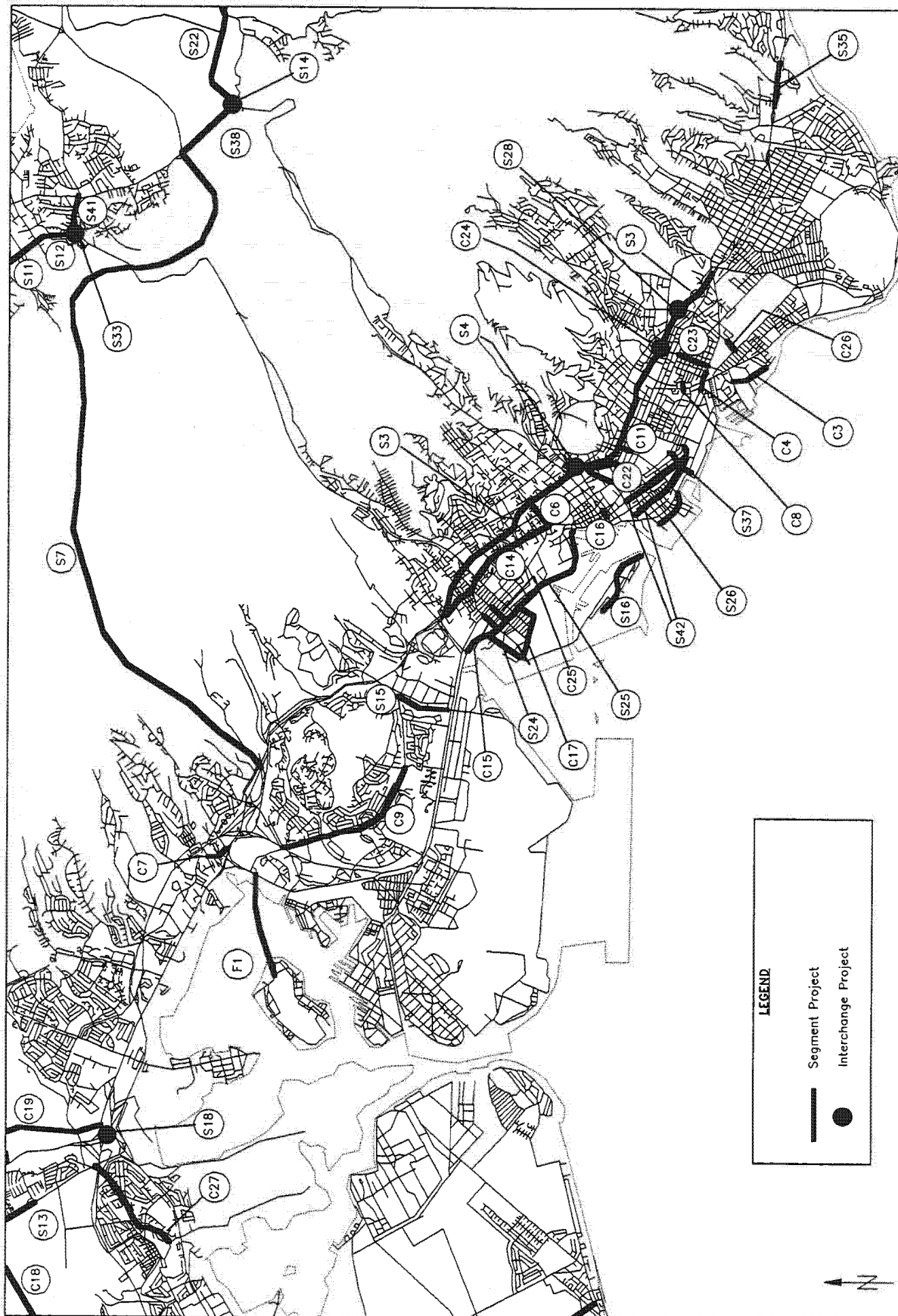
**TABLE 3-3
HIGHWAY ELEMENT, FEDERAL SYSTEM
2020 OAHU REGIONAL TRANSPORTATION PLAN**

Map #	Facility	Location	Description	Estimated Cost [a]
FEDERAL PROJECTS: 1995-2000				
F1.	Ford Island Access Rd*	Ford Island to Kamehameha Hwy	Construct new 2-lane causeway intersecting Kamehameha Hwy at-grade opposite inbound Salt Lake Bl	n/a (100% Federal funding)

Notes:

* Denotes baseline project.

a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction. For projects currently underway, represents estimated remaining unencumbered cost to complete (i.e., does not include awarded, obligated or spent funds).



**FIGURE
3-3**

HIGHWAY CAPACITY ELEMENT PRIMARY URBAN CENTER

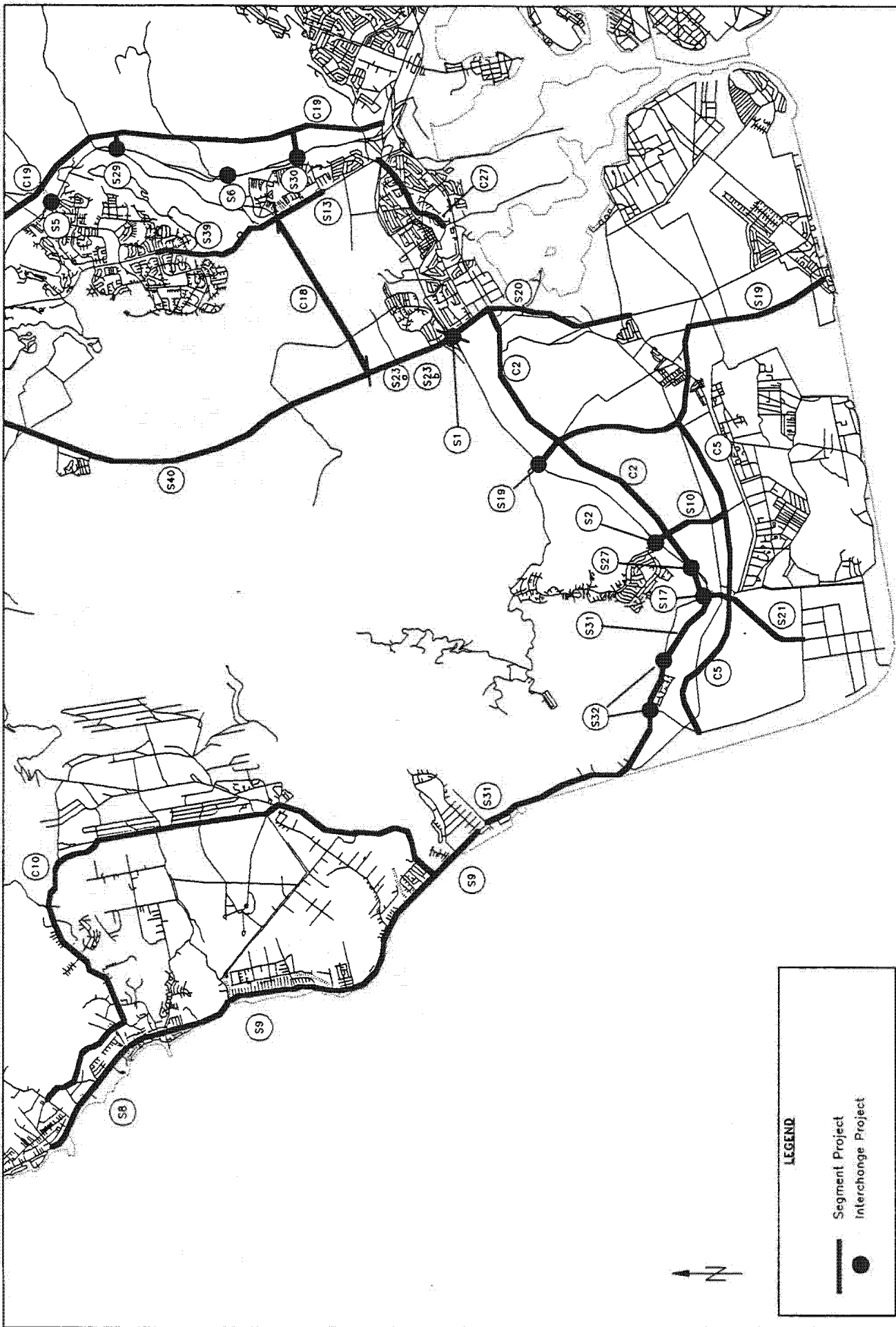
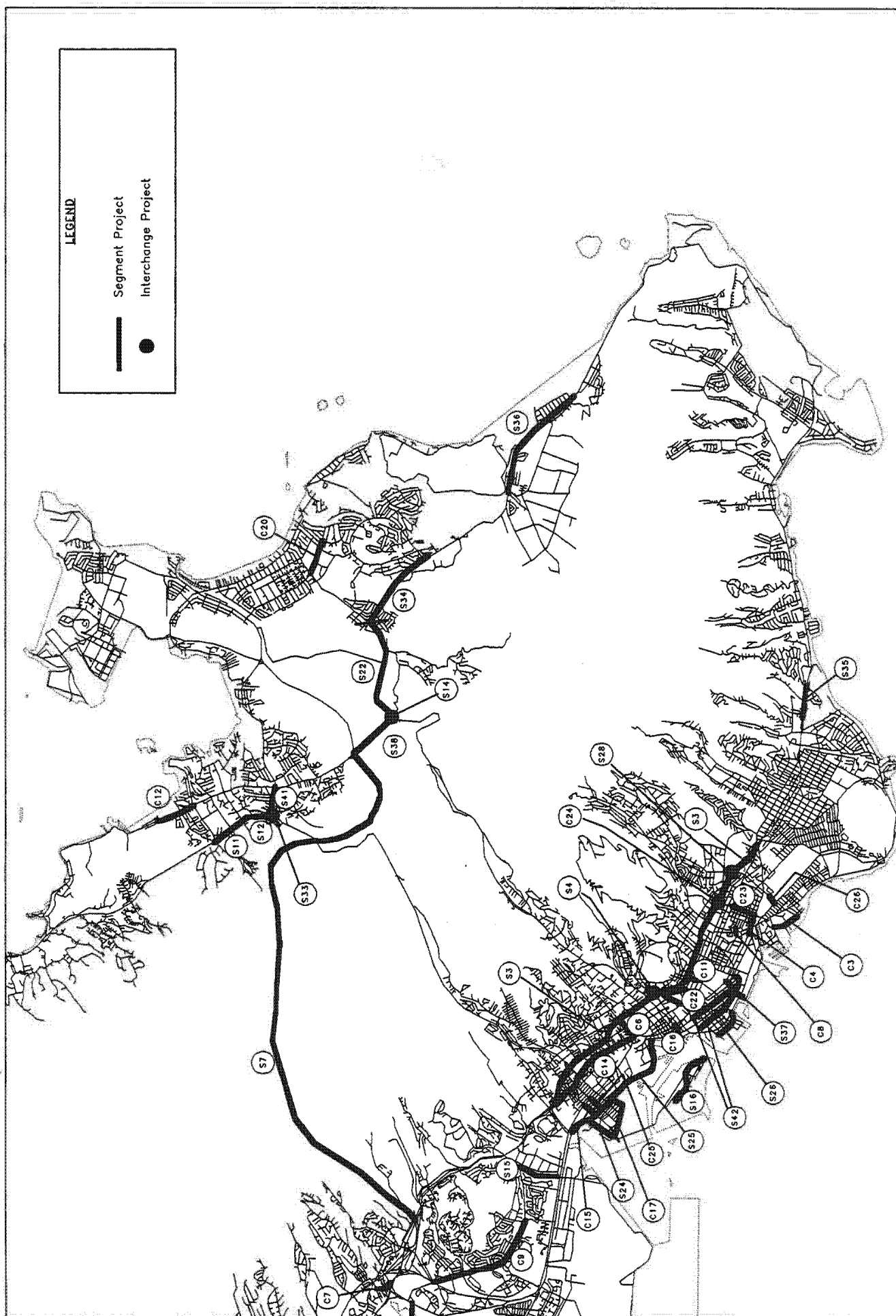


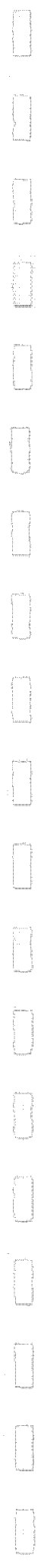
FIGURE
3-4

HIGHWAY CAPACITY ELEMENT EWA/KAPOLEI



**HIGHWAY CAPACITY ELEMENT
WINDWARD/EAST HONOLULU**

FIGURE 3-6



IV. TRANSIT ELEMENT

Public transportation is an important component in the transportation system for Oahu. As an alternative to automobile travel, public transit provides an opportunity to increase the capacity of the overall transportation system and to reduce roadway congestion, air and noise pollution, and energy consumption. In addition, public transit offers mobility to the elderly and handicapped, and to people who do not have access to automobiles.

This chapter describes the existing transit system on the island of Oahu, discusses various issues concerning the improvements to the transit system, and presents the improvements and programs comprising the Transit Element of the Oahu Regional Transportation Plan.

EXISTING TRANSIT SYSTEM

Public Transit Services

The Honolulu Public Transit Authority (HPTA), created in January 1992, is the primary agency overseeing public transit services on Oahu, through TheBus, TheHandi-Van, and the Private Enterprise Participation (PEP) contracted bus services. TheBus system, a regularly scheduled, fixed-route public transit service operated by Oahu Transit Service (OTS), is the backbone of basic transit services in Oahu. TheHandi-Van service, a paratransit service for semi-ambulatory and non-ambulatory persons with disabilities, is operated by Mayflower Contract Services (MCS). The HPTA is also responsible for the PEP contracted services through various contractors which complements and is part of TheBus system.

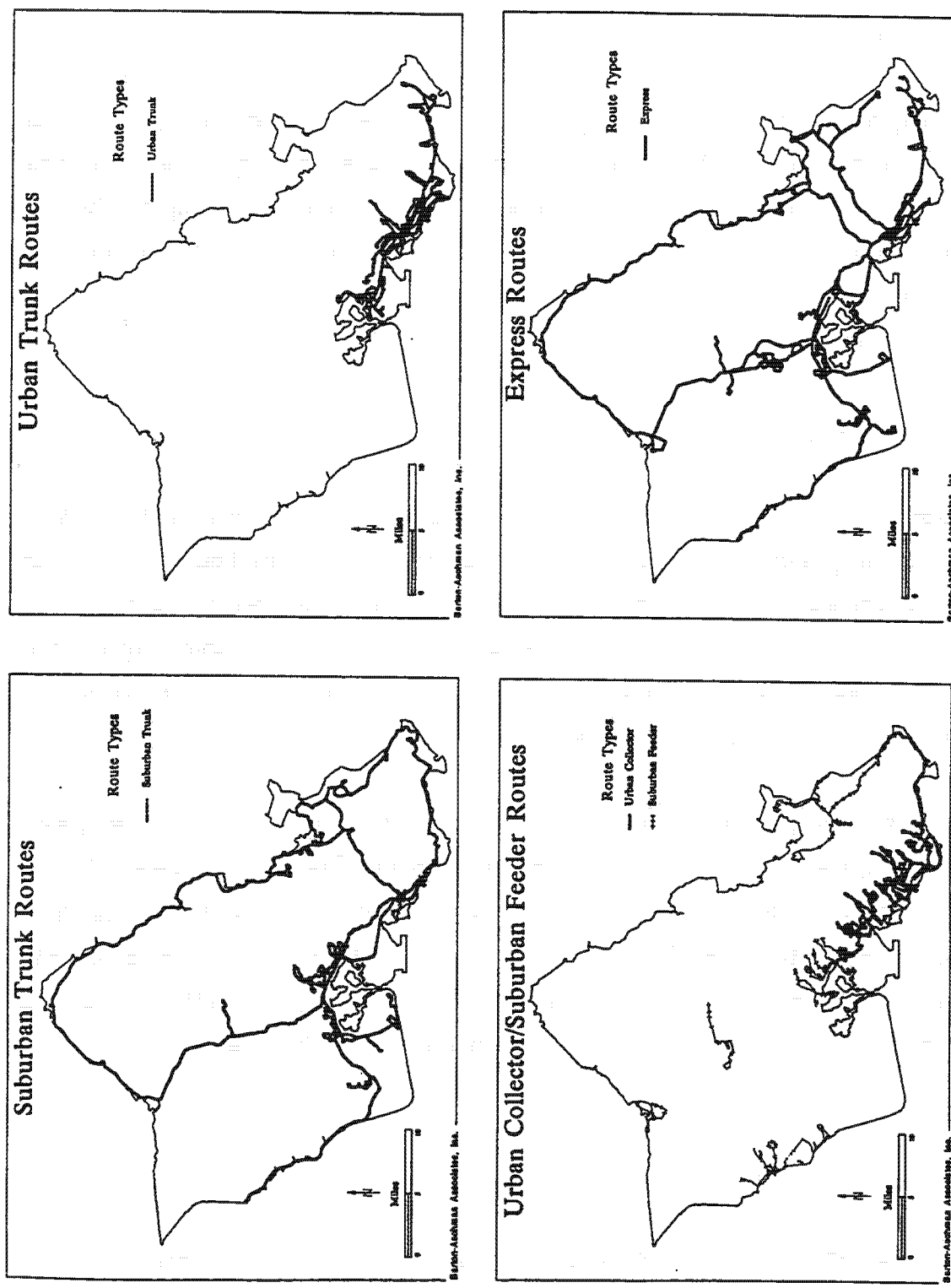
TheBus System. TheBus system provides 65 numbered bus routes and over 120 subroutes, with a fleet of 495 buses (including standard buses, articulated buses, and mini-buses). TheBus system carries over 80 million passengers annually. TheBus service is subdivided into five different service categories as follows:

- Urban Trunk Routes - Urban trunk routes provide direct bus service along the Ewa/Diamond Head arterials from Pearl Harbor to East Oahu in the Primary Urban Center (PUC). These routes provide the greatest transit service between neighborhoods located on opposite sides of the Downtown area. Service on the urban trunk routes provides combined peak period headways of less than 5 minutes on most of the primary Ewa/Diamond Head arterials in the Primary Urban Center.
- Urban Collector Routes - Urban collector routes are designed primarily to provide access to the transit system for neighborhoods within the Primary Urban Center that are not directly served by urban trunk routes. This type of service also provides short-range circulation within neighborhoods. Most of these routes operate at headways of 15 to 30 minutes in the peak periods and 30 to 60 minutes in the off-peak periods.
- Suburban Trunk Routes - Suburban trunk service is designed primarily to provide a direct, multi-stop connection between the suburban neighborhoods outside of the PUC and the activity centers located within the PUC. This type of service is also used for providing circulation between suburban neighborhoods. Most of these routes operate at headways of 10 to 20 minutes in the peak periods and 20 to 30 minutes in the off-peak periods.
- Suburban Feeder Routes - Suburban feeder routes are designed to provide access to the transit system for neighborhoods outside of the PUC that are not directly served by suburban trunk lines. This service also provides short-range circulation within suburban neighborhoods. Most of these routes operate at headways of approximately 60 minutes.
- Express Routes - Express bus service is designed primarily to provide direct non-stop connections between the outlying suburban neighborhoods and the major activity centers within the PUC. All express bus service are scheduled during peak and shoulder peak periods.

In addition to the above five service categories, five express bus routes (Routes 94, 97, 101, 103 and 104) are operated by the Private Enterprise Participation (PEP) program. This program is designed to take advantage of the private resources available to supplement the passenger carrying capacity of TheBus system.

The systemwide route network is illustrated in Figure 4-1 by service categories. As seen in the figure, urban trunk routes are concentrated in the Primary Urban Center while suburban trunk routes and express routes are distributed over the island.

TheHandi-Van System. Unlike the fixed-route characteristics of TheBus system, TheHandi-Van system is a demand-responsive paratransit system. It provides curb-to-curb service upon request specifically for qualified disabled persons who cannot use the regular bus services. The HPTA oversees the operation of the system but the service itself is contracted out to a private company.



Source: "Honolulu - TheBus - Comprehensive Operations Analysis," Honolulu Public Transit Authority, August, 1993.

FIGURE 4-1
EXISTING PUBLIC TRANSIT SYSTEM

Currently, TheHandi-Van system operates from 5:00 AM to 12:00 midnight on weekdays and 6:00 AM to 12:00 midnight on weekends and holidays. However, one day advance reservation is required for service.

TheHandi-Van system operates a fleet of 92 vehicles which includes school buses and different types of vans. According to the *Short-Range Transit Plan Update, Fiscal Year 1993, Technical Report* (Department of Transportation Service, City and County of Honolulu, April 1992), the annual ridership for 1992 was about 690,000 trips and the average subsidy per trip was approximately \$8.60.

Private Transit Services

A number of private companies provide special public transportation services on Oahu. Many of these services are geared towards tourist travel needs, such as chartered bus service to and from the airport, pre-arranged service between hotels and tourists attractions, and the Waikiki trolley. There are, however, other services that serve the needs of local residents, such as bus and van services between the airport and various areas of Oahu, the Dole Pineapple bus service between Waikiki and Iwilei, and transit services for students.

The Leeward Oahu Transportation Management Association (LOTMA) offers the Transhawaiian Commuter Express, a subscription bus service serving commuters between the Leeward Oahu area and downtown Honolulu, Ala Moana, and Waikiki. The three routes operate from Mililani/Waipio, Ewa, and Makakilo. A total of four buses are used to serve the three routes, with two buses operating from Mililani/Waipio. Passholders are eligible for the LOTMA Guaranteed Ride Home Program which provides up to four emergency taxi trips per year.

ISSUES

The Transit Element of the ORTP was developed with consideration given to a variety of issues which affect the existing and future transit system on Oahu. These issues relate to the high utilization of and overcrowding on the existing TheBus system, the need for additional

maintenance facility capacity, issues associated with the inclusion of a rapid transit system in the plan, financial limitations, and potential future alternatives regarding service providers and types of service.

Overcrowded Transit System

TheBus system, although heavily utilized and one of the most productive transit systems in the country, also suffers from significant overcrowding during peak periods on many routes (particularly those routes serving the downtown Honolulu and Waikiki areas). As noted in the *Report of the City & County of Honolulu Transportation & Traffic Management Planning Task Force to the City Council Committee on Transportation* (July 1993), the overcrowding and increasing traffic congestion has lead to a decline in bus speeds and associated reductions in schedule reliability. *TheBus Comprehensive Operations Analysis* (Barton-Aschman Associates, Inc., August 1993) recommends that additional capacity (i.e., bus trips) be added to various routes to address the issue of overcrowding, to provide more frequent service, and/or to improve on-time performance.

Maintenance Facilities

The existing TheBus maintenance facilities operate near capacity and are not able to support significant increases in the bus fleet. The *Comprehensive Bus Facility and Equipment Requirements Study* (Parsons Brinckerhoff Quade & Douglas, Inc., 1994) analyzed alternative sites for new and/or expanded maintenance facilities, and recommends development of a new maintenance facility at either the Pearl City Junction or Manana Storage sites as well as improvements to the existing Halawa and Kalihi-Palama bus facilities. The study also recommends construction of a new Handi-Van maintenance facility. These recommendations have been incorporated into the Transit Element of the Oahu Regional Transportation Plan discussed below.

Inclusion of Rapid Transit in Plan

A rapid transit system extending from Pearl City to UH Manoa is included as part of the 2020 ORTP. The rapid transit system is described as a high-capacity rapid transit system operating on exclusive right-of-way, and could be a rail rapid transit, monorail, light rail, or busway system. Although the plan does not specify or recommend a specific type of system, the rail rapid transit system as described in the Locally Preferred Alternative (as amended July 8, 1992) has been used in the transportation plan for costing purposes only.

The ORTP is used as a blueprint for identifying the development of future transportation improvements on Oahu. It should be noted, however, that the inclusion of a project (such as rapid transit) into this plan does not guarantee its construction. Rather, it allows a project to proceed to a series of more detailed evaluations, and allows these phases to be eligible for federal funding. During this period, a project could be postponed or terminated for any number of reasons, such as environmental impacts, costs, or lack of public support.

Besides providing a necessary people moving capacity in the Pearl City to UH Manoa corridor, the rapid transit system is identified in Honolulu's *General Plan*, Development Plan-Special Provisions, and Development Plan-Common Provisions as a policy directive. This policy directive is interpreted to mean that a rapid transit system is part of Honolulu's long-range plan and an attempt will be made to finance that system. OMPO's Policy Committee has concurred with this city policy through endorsements of earlier regional transportation plans and a list of baseline projects for this 2020 planning effort, all of which included a rapid transit system. This is consistent with federal regulations requiring the regional transportation plan to reflect an area's comprehensive long-range land use plan and metropolitan development objectives.

The ORTP must also include a financial plan that reflects funding sources that can reasonably be expected to be available. Federal regulations state that, if a funding shortfall exists, it be so stated and proposed new revenues and/or revenue sources to cover the shortfall be identified, including strategies for ensuring their availability. As discussed in Chapter VI, for purposes of this 2020 planning effort, potential funding sources for the rapid transit system would include federal discretionary capital transit funds, increases in the gas tax and vehicle registration fees,

and an excise tax surcharge. The actual funding sources for this or any other transportation project will be identified during subsequent detailed studies for the project.

Rapid Transit Extensions

Policies established in the City *General Plan* identify provision of a mass transit system within the Ewa, Central Oahu, and Pearl City to Hawaii Kai corridors. As discussed above, a rapid transit system on exclusive right-of-way has been included in the ORTP in the PUC corridor from Wahiawa/Pearl City to UH Manoa. Possible extensions of this system to Hawaii Kai to the east and to Ewa and Central Oahu to the west and north, as well as to Windward Oahu, were evaluated as part of the alternatives analysis for the ORTP. These extensions were evaluated and found not to be cost-effective, and they were excluded from the ORTP. Alternatively, the ORTP envisions new and enhanced express bus services in these corridors as part of the bus fleet and service increases included in the plan.

Financial Constraints

The transportation modelling conducted as part of development of the ORTP projected that a bus fleet of about 780 vehicles would be needed to accommodate projected future ridership levels at design loads (assuming implementation of the rapid transit system discussed previously). An ultimate Handi-Van fleet of 150 vehicles was also evaluated. However, financial constraints imposed by the projected availability of future revenues limited the planned fleet expansion to 715 buses and 125 Handi-Van vehicles.

Private Transit Providers

At present, the majority of the public bus system on Oahu is operated by Oahu Transit Service under contract to the Honolulu Public Transit Authority (HPTA), a division of the City and County of Honolulu. Five of the express bus routes, however, are currently operated by private transit providers through the Private Enterprise Participation (PEP) program. For costing purposes, it

was assumed that the bus fleet increases included in the ORTP would be increases to the public bus fleet. However, the plan does not specify or recommend specific operators, and it is possible that additional services could be operated by the private sector after further specialized study of this issue.

Transit Service Types

At present, the public bus system on Oahu provides regularly scheduled, fixed-route service using a fleet of standard buses, articulated buses, and mini-buses. Consideration of alternative service types, such as jitneys, shared-ride taxi, local circulators and shuttles, and/or more subscription bus services (beyond those currently operated by the Leeward Oahu Transportation Management Association), may become appropriate to serve future travel patterns. For costing purposes, it was assumed that the bus service increases included in the ORTP would be similar in nature to the existing service characteristics. However, potential alternative service types could be identified, evaluated, and recommended through future study.

TRANSIT PLAN

The objective of the Transit Element of the Oahu Regional Transportation Plan is to aid in increasing the overall capacity of the transportation system by improving transit system capacity and efficiency and promoting transit ridership. The Transit Element consists of transit system capacity (i.e., fleet) increases, new bus maintenance facilities, transit centers, bus signal preemption, other associated transit system programs, and construction of a rapid transit system on an exclusive right-of-way in the PUC corridor.

Table 4-1 lists the programs and improvements comprising the Transit Element. The table also indicates the estimated capital cost and/or annual operating and maintenance (O&M) cost to implement each project, in 1994 dollars. Key components of the Transit Element include:

- **Bus and Handi-Van Fleet Increases** - The planned bus fleet size of approximately 715 vehicles represents an increase of about 220 vehicles from the existing 495-vehicle fleet, while the planned Handi-Van fleet of approximately 125 vehicles represents an increase

of 33 vehicles from the existing 92-vehicle fleet. Given the current system overcrowding and the projected need for additional transit system capacity in the short- to intermediate-term, the plan assumes that the fleet increases will occur in the first 12 years of the plan (by Year 2006), after which the bus fleets would stabilize in size with continuing bus purchases for replacement purposes. The expanded bus fleet would be used both to add capacity on existing routes and to provide additional services to/from and within the Ewa/Kapolei and Central Oahu growth areas.

- **Bus System Support Facilities** - The recommendations of the *Comprehensive Bus Facility and Equipment Requirements Study* regarding new and expanded bus maintenance facilities, transit centers, bus stop site improvements, and other TheBus equipment and special program needs have been incorporated into the transit plan.
- **Rapid Transit System** - As discussed previously, the plan includes construction of a new rapid transit system on an exclusive right-of-way in the PUC corridor in the Year 2006-2020 time period. Figure 4-2 illustrates the general corridor within which the proposed rapid transit system would likely be located. The technology and precise alignment of the rapid transit system will be determined through future study. After the rapid transit system becomes operational, the bus system would be restructured to reduce parallel services and to provide feeder service to the rapid transit system.

**TABLE 4-1
TRANSIT ELEMENT
2020 OAHU REGIONAL TRANSPORTATION PLAN**

Improvement	Description	Estimated Cost [a]	Time Frame
Increased Bus Fleet & Service Levels	Bus fleet enlarged to ~715 vehicles (could be combination of increases in TheBus service & private operators)	\$457.2M + \$125.7/yr O&M [b]	715 vehicle fleet reached by 2006
	Additional service added outbound from Waiawa to Kapolei & Central Oahu areas	included in above	2001-2005
	Additional service added within/between Kapolei & Central Oahu areas	included in above	2001-2005
Increased Handi-Van Fleet	Handi-Van fleet increased to ~125 vehicles	\$48.6M + \$10.1M/yr O&M [c]	125 vehicle fleet reached by 2006
New or Expanded Bus System Base Facilities	Halawa bus facility improvements	\$5.0M, \$15.0M	1995-2000, 2006-2020
	Kalihi-Palama bus facility improvements	\$2.7M, \$15.0M	1995-2000, 2006-2020
	Pearl City Junction or Manana Storage bus maintenance facility	\$29.0M, \$7.3M	1995-2000, 2001-2005
	Handi-Van maintenance facility	\$14.9M	1995-2000
Bus-Only Facilities	Kalaniana'ole Hwy to East Honolulu (express bus facility as exclusive lanes or shared in HOV lane; AM peak inbound & PM peak outbound)	\$0.15M/yr O&M	1995-2000
Bus Signal Preemption	Express bus routes (specific routes and/or signals to be identified through future study)	\$6.0M + \$1.8M/yr O&M	1995-2000, 2001-2005
Park-and-Ride Lots	(see TDM Element)	(see TDM Element)	(see TDM Element)
Transit Centers/ Intermodal Terminals	Aala Park	\$0.2M	1995-2000
	Alapai Terminal	\$2.1M	1995-2000
	Aloha Stadium - Phase I	\$0.6M	2001-2005
	Aloha Stadium - Phase II	\$2.7M	2006-2020
	Pearlridge Shopping Center	\$0.1M	1995-2000
	University of Hawaii Manoa	\$0.1M	1995-2000
	Waipahu	\$2.3M	2001-2005
	Leeward Oahu	\$2.3M	2001-2005
	Rapid transit stations	[d]	2006-2020

TABLE 4-1 (continued)
TRANSIT ELEMENT
2020 OAHU REGIONAL TRANSPORTATION PLAN

Improvement	Description	Estimated Cost [a]	Time Frame
TheBus Equipment & Special Programs	Electronic fareboxes	\$4.5M	1995-2000, 2001-2005, 2006-2020
	Automated vehicle monitoring	\$3.4M	1995-2000
	Radio system enhancement	\$1.2M	1995-2000
	Management information program	\$0.5M	1995-2000
	Tow wreckers	\$2.6M, \$2.6M	1995-2000, 2006-2020
Bus Stop Site Improvements	Bus bays, pads, shelters, benches, ADA improvements, etc.	\$4.5M	1995-2000, 2001-2005, 2006-2020
New Service Types (subject to future study)	<ul style="list-style-type: none"> • Jitneys • Subscription bus services • Shared-ride taxi • Local circulators & shuttles 	assume included in bus fleet costs	subject to future study
Rapid Transit in PUC Corridor*	High-capacity rapid transit system operating on exclusive right-of-way from Pearl City to UH Manoa (technology and alignment to be determined through future study)	\$1,837.8M + \$52.0M/yr O&M [e]	2006-2020

Notes:

- * Denotes baseline project.
- a. All cost estimates in millions of 1994 dollars.
- b. Bus costs are estimates for operation of entire system, not just incremental increase. Capital costs assume 12-year vehicle replacement cycles through the Year 2020. O&M cost shown is estimated annual average at ultimate fleet size. Costs could vary depending upon extent to which future services are provided by private operators.
- c. Handi-Van costs are estimates for operation of entire Handi-Van system, not just incremental increase. Capital costs assume 5-year replacement cycle. O&M cost shown is estimated annual average at ultimate fleet size.
- d. Included in rapid transit costs.
- e. O&M cost shown is estimated annual average at full operation.



**FIGURE
4-2**

RAPID TRANSIT CORRIDOR

V. TRANSPORTATION DEMAND MANAGEMENT ELEMENT

Transportation demand management (TDM) measures consist of a variety of types of measures to reduce vehicle trip generation, either through increased ridesharing or use of alternative modes such as bicycles or walking. This chapter describes existing transportation demand management measures in place on the island of Oahu, discusses various issues concerning the implementation of such measures, and presents the programs comprising the Transportation Demand Management Element of the Oahu Regional Transportation Plan.

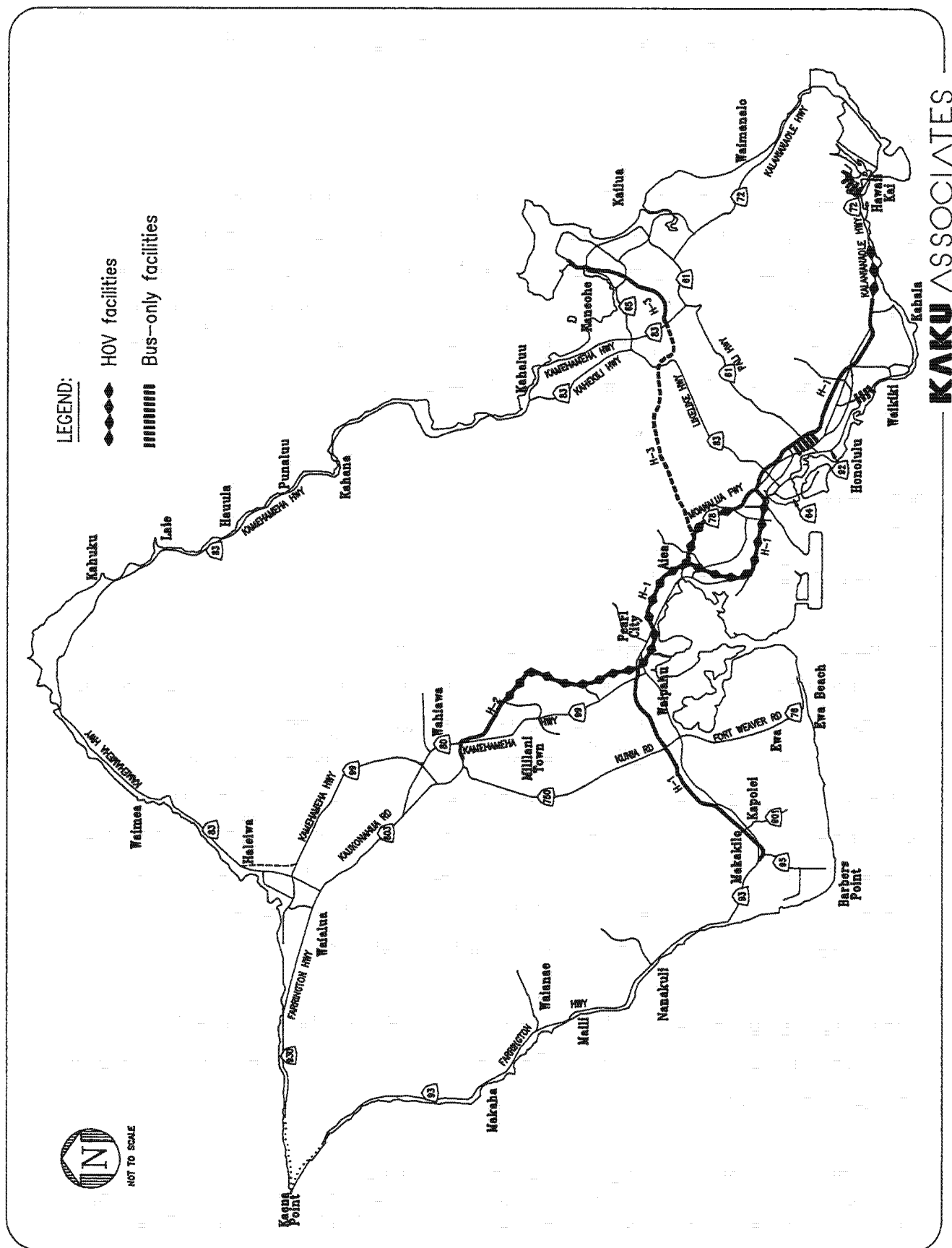
EXISTING SYSTEM

High-Occupancy Vehicle System

The high-occupancy vehicle (HOV) system consists of HOV lanes, bus-only lanes, and park-and-ride lots. High-occupancy vehicle lanes are freeway or street travel lanes which are utilized exclusively by carpools and/or buses. Depending upon roadway and traffic characteristics, HOV lanes can be implemented as freeway median lanes, concurrent flow (curb or left-side) lanes, reversible lanes or contraflow lanes, or as an entirely separate facility. HOV facilities serve as incentives for people to carpool, vanpool or ride public transit since travel time is reduced on such an exclusive right-of-way. As more people rideshare, the people-carrying capacity of the street system increases. Park-and-ride lots can serve as both staging areas for formation of carpools and vanpools and collection points for transit services.

High-Occupancy Vehicle Facilities. Several HOV and bus-only facilities on Oahu are provided by the State and/or the City. The existing HOV and bus-only facilities are illustrated on Figure 5-1, and include the following:

- **Interstate H-1** - One inbound lane of the freeway is reserved for both carpools and buses between the Waiawa and Keehi Interchanges during the morning peak period. Similarly, one outbound lane of the freeway is reserved for HOV use between the Keehi Interchange



**FIGURE 5-1
EXISTING HOV AND BUS-ONLY FACILITIES**

and Lehua Avenue during the afternoon peak period. At other times of the day, these lanes revert to general purpose use.

- Interstate H-2 - Exclusive median HOV lanes (one in each direction) were recently constructed for both carpools and buses between the Waiawa and Mililani Interchanges.
- Moanalua Freeway - A two-mile concurrent-flow HOV lane is provided in the Kokohead direction from the Halawa Interchange to the Puuloa Interchange during both the morning and afternoon peak periods. At other times of the day, the lane reverts to general purpose use.
- Kalanianaʻole Highway - A contraflow HOV lane is provided for both carpools and buses in the Ewa direction from West Halemaumau Street to Ainakoa Avenue during the morning peak period. At other times of the day, the lane reverts to outbound general purpose use.
- Hawaii Kai Drive - A bus-only lane is provided makai-bound from Pepeekeo Street to Kawaihae Street in Hawaii Kai during the AM peak period.
- Kawaihae Street - A bus-only lane is provided makai-bound from Hawaii Kai Drive to Kalanianaʻole Highway in Hawaii Kai during the AM peak period.
- Hotel Street Bus Mall - A 10-block section of Hotel Street between River Street and Alakea Street in downtown Honolulu functions as a bus-only transit mall, serving many of the urban trunk routes of TheBus system.
- Kalakaua Avenue Bus Lane - A four-block Ewa-direction bus-only lane is present between Kuhio Avenue and Ena Road, to provide more direct routing of TheBus services in Waikiki.

Park-and-Ride Lot System. Three park-and-ride lots are currently in operation on Oahu:

- Hawaii Kai - An exclusive park-and-ride lot located on Keahole Street mauka of Kalanianaʻole Highway.
- Mililani Mauka - An exclusive park-and-ride lot located adjacent to the Mililani Interchange in Mililani Mauka.
- Wahiawa - A shared-use lot at the Wahiawa National Guard Armory.

In addition, a park-and-ride lot is funded and scheduled for construction in Royal Kunia.

Bicycle System

According to the *Bike Plan Hawaii, A State of Hawaii Master Plan* (Highways Division, Department of Transportation, State of Hawaii, April 1994), the island of Oahu has approximately 55.4 miles of existing bikeways. Most of the current bike facilities are located within the Primary Urban Center. About 21.2 miles of the bicycle facilities fall under the jurisdiction of the State, while 34.2 miles are under the jurisdiction of the City and County of Honolulu. The bicycle facilities are classified into three categories:

- **Bicycle Route** - Any street or highway so designated, for the shared use of bicycles and motor vehicles and/or pedestrians. Bike routes are of two types: a widened curb lane in an urban-type area or a paved right shoulder in a rural-type area. Approximately 16.7 of the existing bikeway miles on Oahu are classified as bicycle routes.
- **Bicycle Lane** - A portion of a roadway designated by striping, signing, and pavement markings for the preferential or exclusive use of bicycles. Only crossflows by motor vehicles or pedestrians to gain access to driveways or parking facilities or bus stops are allowed. There are approximately 18.8 miles of bicycle lanes on Oahu.
- **Bicycle Path** - A completely separated right-of-way normally designated for the exclusive use or semi-exclusive use of bicycles. Where such a facility is adjacent to a roadway, it is separated from the roadway by a significant amount of open space and/or a major physical barrier (such as trees or a considerable change in ground elevation). There are approximately 19.9 miles of bicycle paths on Oahu.

Pedestrian System

The major pedestrian activity centers on the island are mostly located within the Primary Urban Center. Downtown Honolulu (with its concentration of office buildings as well as the adjacent Chinatown area) and the tourist-oriented Waikiki and Ala Moana areas are all significant generators of pedestrian activities. Other pedestrian centers include the University of Hawaii, major shopping centers, beaches, parks, and schools. In addition, two pedestrian malls (Palailai Mall and Wai Aniani Way) are proposed as part of development of the City of Kapolei.

Other Transportation Demand Management Measures

Various organizations and agencies on Oahu sponsor or support implementation of various transportation demand management programs. The Leeward Oahu Transportation Management Association (LOTMA) sponsors carpooling and vanpooling programs, offers computerized ridematching assistance, and provides subscription bus services and a guaranteed ride home program. The State Department of Transportation sponsors a commuter vanpool program. Also, many private businesses offer company shuttles, vanpooling, and/or subsidized bus passes as part of travel demand management strategies.

ISSUES

The development of the Transportation Demand Management Element of the ORTP was conducted with consideration given to a variety of issues which affect the implementation and potential effectiveness of the various TDM measures. These issues relate to the type and nature of the various measures, equity issues associated with their implementation, the potential need for mandates rather than relying on voluntary implementation of TDM measures, and the necessary incentives and disincentives necessary to assist in their ultimate effectiveness.

Transportation Systems Management Study

The *Final Report, Transportation Systems Management Study* (Wilbur Smith Associates, January 1994) identifies and evaluates various types of transportation systems management (TSM) and transportation demand management (TDM) measures and recommends a series of actions for implementation on Oahu. The recommended TSM and TDM actions were categorized into core group, key supporting, other supporting, and contingency actions. The actions are intended to achieve the following objectives: improve attractiveness of alternative travel modes, including transit and paratransit service; provide disincentives to single-occupant automobile use; reduce the need to travel during peak hours; and improve roadway efficiencies through low-cost measures to increase vehicular capacity. Recommended actions include: transit and paratransit improvements (expansion of and operational improvements to TheBus system, jitneys,

subscription bus, shared-ride taxi); high-occupancy vehicle (HOV) lanes; ridesharing; park-and-ride lots; parking management measures (controlling parking supply, reducing employee parking subsidies, pricing); work behavior changes (telecommuting, variable work hours); land use actions; and operational improvements (intersection, street and freeway improvements, smart streets). More extreme measures such as road pricing, trip reduction ordinances, and vehicle use limitations are recommended as contingency actions. The recommendations of the study have been endorsed in concept and in principle by the OMPO Policy Committee, and various measures recommended in the study have been incorporated into the appropriate elements of the ORTP. The TDM program included in the ORTP is consistent with the recommendations of the TSM study.

Implementation

Even under the best of circumstances, most transportation demand management measures are very difficult to implement, much less expect the average worker to embrace. It should be recognized that the most effective way to gain widespread acceptance of TDM programs is for the public sector to take the first step and fully implement the necessary measures. By taking the lead, the governmental agencies are in a much better position to encourage the rest of the community to take on the responsibility of implementing and accepting the need for these trip reducing measures. This ensures that the most common complaint among the private sector employers and employees is eliminated and that they do not feel they are taking the brunt of the responsibility for the implementation of TDM programs. It is particularly important that the public agencies do not offer parking to its employees without cost or even at a reduced rate. The availability and cost of parking from the perspective of the employee is one of the key determinants in selecting a mode of travel to and from work.

Mandates Versus Voluntary Measures

Transportation demand management strategies have been a part of the regional transportation plan on Oahu for many years. However, transit mode splits and average automobile occupancies for work trips during the peak periods are relatively high on Oahu, this can be

traced mainly to other factors unrelated to efforts associated with TDM programs. These include the historically high quality of the bus service, socioeconomic conditions, and cultural habits of the residents. If a measurable increase in these two identifiers of successful TDM programs is to be achieved, it may be necessary to implement mandatory TDM programs rather than to let them remain as voluntary programs. While solving some problems, the implementation of mandatory programs bring with them new problems. These include the need to establish specific and quantitative goals and objectives, means of enforcement, and punitive measures for those that do not comply. These all have far reaching implications both culturally as well as institutionally.

Incentives Versus Disincentives

Experience with more mature TDM programs vindicate the need to couple incentives with disincentives, restrictions with alternatives. Experience in other urban areas indicates that providing incentives to encourage ridesharing, without providing disincentives to the use of the single-occupant automobile, often does not achieve significant mode shifts. At the heart of most successful TDM programs are various measures to discourage employees from driving to work alone. These include restricting the supply of workplace parking, raising the cost of parking, and placing a premium on the cost of using transportation facilities during the peak periods.

While effective, these measures are not equitable or responsible unless they are also coupled with efforts to ensure that alternative means of travel are available. These include improved transit service to work places, ease in arranging and maintaining carpools and vanpools, reduced costs and/or conveniently located parking for carpools and vanpools, and employer-based transportation programs that provide monetary incentives to rideshare or to use transit. The need for a balanced program that provides employees with both viable alternatives to driving alone and incentives to rideshare is the key to a successful TDM program.

TRANSPORTATION DEMAND MANAGEMENT PLAN

The Transportation Demand Management Element of the Oahu Regional Transportation Plan consists of measures and strategies designed to reduce the vehicular demands placed on the transportation system, including construction of an expanded and integrated high-occupancy vehicle lane system, new park-and-ride lots, and bicycle facilities. The plan also supports measures to encourage reductions in work trips such as rideshare programs, work behavior changes (e.g., flexible work hours), and parking management, and recommends formation of new transportation management associations (TMAs) and adoption of a trip reduction ordinance to further facilitate implementation of employer-based TDM measures.

Table 5-1 describes the TDM Element of the plan, while Table 5-2 provides greater detail regarding the HOV component of the TDM Element. The table also indicates the estimated capital cost and/or annual recurring cost to implement each project, in 1994 dollars. Figures 5-2 through 5-5 illustrate the locations of the HOV projects by area. Figure 5-6, reproduced from the *Bike Plan Hawaii, A State of Hawaii Master Plan*, illustrates the bicycle system master plan.

The key components of the TDM Element of the ORTP consist of the following:

- HOV and Park-and-Ride Lot System - Provision of an integrated HOV lane and park-and-ride lot system is intended to provide travel time savings to carpools and vanpools, to encourage increased ridesharing. The planned ultimate HOV system includes HOV lanes on most of the major corridors on the island, including the Kalanianaʻole Highway/H-1/Kapiolani Boulevard corridor to/from Hawaii Kai, the H-1 corridor to/from Kapolei, the H-2 corridor to/from Mililani, and the Moanalua Freeway/King Street corridor. Two parallel HOV lanes would be provided on H-1 from the Keehi Interchange to the Waiawa Interchange during each peak period, with one continuing to Kapolei and the other to Mililani. The Nimitz Highway Viaduct HOV facility would connect these lanes to downtown Honolulu.
- Rideshare Programs - The ORTP recommends that various incentive programs be implemented to further encourage ridesharing among both public and private sector employees. Provision of carpool/vanpool matching services can be accomplished as a function of the planned transportation management associations (discussed below) rather than at a company or employer level, as such programs are typically more successful the larger the potential pool of carpoolers. Guaranteed ride home programs, while relatively inexpensive, have been found to be proven incentive for ridesharing, and should also be implemented at the TMA level. Requiring that preferential employee carpool/vanpool parking be provided may require modification to the City Land Use Ordinance.

- Work Behavior Changes - The ORTP also recommends that various incentive programs be implemented to encourage work behavior changes such as telecommuting, flexible work hours, and compressed work weeks. These measures must be implemented by the employer to be effective. Employers could be encouraged to implement work behavior changes as part of the planned trip reduction ordinance.
- Parking Management - Most employers on Oahu, both in the public and private sector, subsidize the cost of employee parking through either the provision of free parking or parking at rates which are substantially below market parking rates. Experience in other urban areas indicates that the most effective means to reduce vehicular trip generation is to increase the cost of driving alone, by increasing parking costs. The ORTP recommends that employee parking subsidies be eliminated by charging employees for parking at or near market rates, and that parking cash-out/travel allowances be provided in their stead. Under the parking cash-out/travel allowance concept, all or part of the subsidy value is rebated to the employee, thus providing a cash incentive to not driving alone and providing funds which could be used for alternative travel such as purchase of a bus pass.

The ORTP also recommends that the amount of required parking to be provided in future developments be reduced via changes to parking requirements in the City Land Use Ordinance. Consideration should be given to replacing minimum parking requirements with a maximum allowable level. To ensure that the various parking management strategies do not simply force employees to parking on adjacent residential neighborhood streets, the ORTP also recommends implementation of a residential permit parking program which would allow the City, upon application by neighborhood residents, to preserve on-street parking in residential neighborhoods for residents and their visitors.

The ORTP provides that the parking pricing and supply reduction measures discussed above be mandated, most likely through City adoption of the planned trip reduction ordinance (discussed below) and changes to the Land Use Ordinance. These measures should apply to both public and private sector employers. Issues associated with implementation of the parking measures recommended in the plan are discussed in the *Final Report, Transportation Systems Management Study*.

- Transportation Management Associations - Transportation management associations are typically organizations of employers within a specific geographic area with the purpose of facilitating implementation of TDM measures. TMAs can provide services which could otherwise be difficult to provide at an employer level (particularly small employers), such as computerized carpool/vanpool matching services, guaranteed ride home programs, vanpool leasing, subscription bus services, marketing and administrative support, etc. The Leeward Oahu Transportation Management Association (LOTMA) is the only TMA on Oahu at present. The ORTP envisions creation of a series of TMAs serving various areas of employment concentration.
- Trip Reduction Ordinance - In order to provide a mechanism to ensure that various employer-based TDM measures are implemented, the ORTP recommends that the City adopt a trip reduction ordinance which would establish numerical trip reduction targets and require developers and employers (both public and private) to prepare and implement trip reduction plans designed to achieve these targets. Other than elimination of parking subsidies (as discussed above), specific measures need not be mandated in

the ordinance so long as the goals are met, providing a degree of flexibility to individual employers. Procedures and penalties should also be established in the trip reduction ordinance if the targets are not met.

- **Bicycle Facilities** - The ORTP incorporates the recommendations of the *Bike Plan Hawaii, A State of Hawaii Master Plan*, regarding the future bikeway system on Oahu. The proposed bike plan calls for new bikeway facilities distributed along the general perimeter of the island as well as throughout various community locations. The proposed plan includes 160.6 miles of bike routes, 108.6 miles of bike lanes, and 23.9 miles of bike paths for a total of 293.1 bikeway miles. In addition to the State of Hawaii bike master plan, the Kapolei Area Long Range Master Plan also proposes that bikeways be provided along many of the planned future streets in the Ewa/Kapolei area.

**TABLE 5-1
TRANSPORTATION DEMAND MANAGEMENT ELEMENT
2020 OAHU REGIONAL TRANSPORTATION PLAN**

Type of Measure	Description	Estimated Cost [a]	Time Frame
HOV Facilities	(see Table 5-2)	(see Table 5-2)	(see Table 5-2)
HOV Facility Enforcement	Enforce HOV lane vehicle occupancy requirements & raise HOV minimum occupancy threshold to 3 persons per vehicle as necessary	\$0.75M/yr enforcement	continuous
Park-and-Ride Lots	Ewa	\$2.7M [d]	2001-2005
	Kapolei Village	\$2.7M [d]	1995-2000
	Mililani Mauka expansion	\$1.3M [d]	2001-2005
	Royal Kunia	[e]	1995-2000
	Windward Oahu (Kaneohe, Kailua)	\$2.7M	2001-2005
	Rapid transit stations	[f]	2006-2020
Rideshare Programs	<ul style="list-style-type: none"> • Matching services • Preferential carpool/vanpool parking • Guaranteed ride home programs 	[b] [c] [b]	continuous
Work Behavior Changes	<ul style="list-style-type: none"> • Encourage telecommuting • Encourage flexible work hours • Encourage compressed work weeks 	[c] [c] [c]	continuous
Parking Management	<ul style="list-style-type: none"> • Mandate reduction of parking supply via code changes • Mandate elimination of employee parking subsidies • Mandate parking cash-out/travel allowance • Mandate pricing strategies • Residential permit parking program 	[c] [c] [c] [c] \$0.04M/yr O&M	2001-2005
Public Transit Support	<ul style="list-style-type: none"> • Transit pass subsidies • Public transit marketing 	[c] [b]	continuous
Transportation Management Associations (TMAs) for geographic areas [g]	<ul style="list-style-type: none"> • Honolulu CBD • Central Oahu • Ewa/Kapolei • Kakaako • Kahili/Iwilei/Airport • Kapiolani/Ala Moana • University • Waikiki 	\$2.4M/yr total (\$0.3M/yr each) [d]	1995-2000, 2001-2005

TABLE 5-1 (continued)
TRANSPORTATION DEMAND MANAGEMENT ELEMENT
2020 OAHU REGIONAL TRANSPORTATION PLAN

Type of Measure	Description	Estimated Cost [a]	Time Frame
Trip Reduction Ordinance	Ordinance mandating preparation & implementation of trip reduction plans by developers & employers: <ul style="list-style-type: none"> Establish trip reduction targets Allow flexibility in plan elements (encourage rideshare programs, parking management, work behavior, TMA participation) 	\$5.0M/yr monitoring & enforcement	1995-2000
Bicycle Facilities	New bike routes, bike lanes & bike paths per <i>Bike Plan Hawaii</i> Master Plan (see Figure 5-6)	\$61.2M [d]: \$11.8M \$23.3M \$26.1M	1995-2000 2001-2005 2006-2020
	Additional bikeways proposed per <i>Kapolei Area Bikeway Plan</i>	[c]	concurrent with development
	Include new bikeways in Central Oahu development plans	[c]	concurrent with development
	Bicycle lockers & showers at employment centers & public multi-modal transit centers	[c]	continuous
Pedestrian Facilities/Walkways	City of Kapolei pedestrian system	[c]	concurrent with development
	Waikiki Master Plan sidewalk improvements	\$11.8M	per MP schedule

Notes:

- a. All cost estimates in millions of 1994 dollars.
- b. Included in estimated TMA costs.
- c. Costs borne by employers and/or developers.
- d. All or portion of costs could be borne by employers and/or developers.
- e. Funds already encumbered.
- f. Included in rapid transit costs (see Table 4-1).
- g. The Central Oahu and Ewa/Kapolei areas are presently served by the Leeward Oahu Transportation Management Association (LOTMA).

TABLE 5-2
TDM ELEMENT - HOV FACILITIES
2020 OAHU REGIONAL TRANSPORTATION PLAN

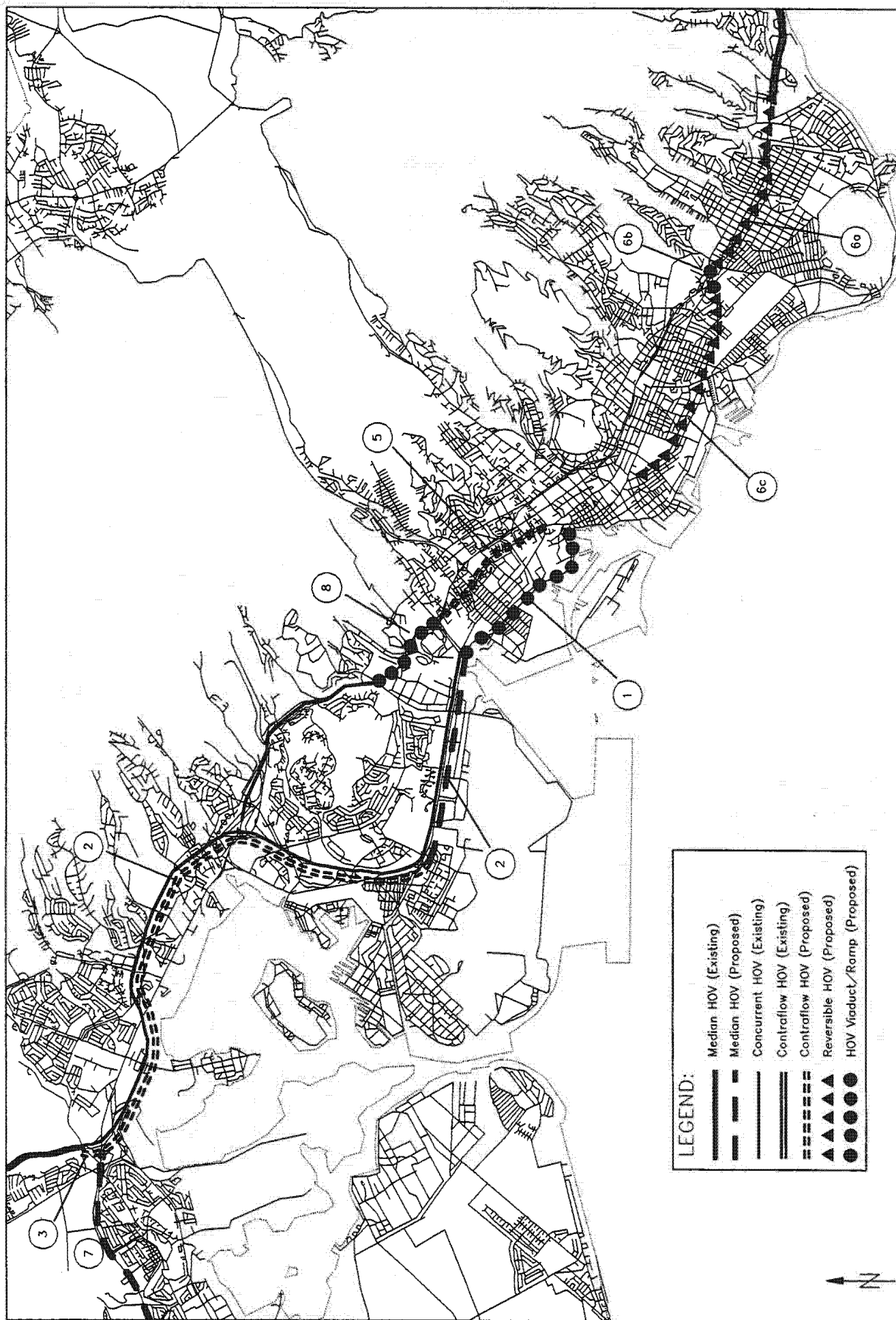
Map #	Location	Description	Estimated Cost [a]
1995-2000			
1.	HOV System: Central (AM peak period)	AM peak operation: <ul style="list-style-type: none">• H-2 inbound HOV lane from Milliani Interchange to Waiawa Interchange• continues as existing H-1 inside HOV lane from Waiawa Interchange to Keehi Interchange• connects to Nimitz Hwy Viaduct HOV facility*	existing existing [b]
2.	HOV System: Leeward (AM & PM peak periods)	AM peak operation: <ul style="list-style-type: none">• H-1 contraflow/median shoulder lane from Waiawa Interchange to Keehi Interchange*:<ul style="list-style-type: none">- HOV lane begins at crossover Ewa of Waiawa Interchange to contraflow HOV lane through Waiawa Interchange- contraflow lane from Waiawa Interchange to Pearl Harbor Interchange (removing 2 outbound lanes while in operation)- median shoulder lane from Pearl Harbor Interchange to Keehi Interchange• connects to Nimitz Hwy Viaduct HOV facility*	\$17.0M + \$0.25M/yr ops [b]
1.			
1.		PM peak operation: <ul style="list-style-type: none">• Nimitz Hwy Viaduct HOV facility* to Keehi Interchange• continues as existing H-1 HOV inside lane from Keehi Interchange to Waiawa Interchange	[b] existing
2001-2005			
1.	HOV System: Central (PM peak period)	PM peak operation: <ul style="list-style-type: none">• Nimitz Hwy Viaduct HOV facility* to Keehi Interchange• connects to H-1 median shoulder/contraflow lane from Keehi Interchange to Waiawa Interchange:<ul style="list-style-type: none">- median shoulder lane from Keehi Interchange to Pearl City Interchange- contraflow lane from Pearl City Interchange to Waiawa Interchange (removing 2 inbound lanes while in operation)• continues through Waiawa Interchange as contraflow lane on H-2 inbound connector & transitions through crossover mauka of Waiawa Interchange to H-2 outbound HOV lane (requires widening of existing inbound connector & bridges)• H-2 outbound HOV lane from Waiawa Interchange to Milliani Interchange	[b] included in 1995-2000 Leeward system cost
2.			
3.			\$8.0M [c] existing
4.	HOV System: East Honolulu (AM peak period)	Kalaniana'ole Hwy from West Halemaumau St to Keahole St: extend existing AM contraflow HOV operation (after completion of widening project); would serve existing park-and-ride lot at Keahole St	\$1.0M

TABLE 5-2 (continued)
TDM ELEMENT - HOV FACILITIES
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Location	Description	Estimated Cost [a]
5.	HOV System: Moanalua (AM & PM peak periods)	North King St from Middle St to Liliha St: contraflow lane HOV (after baseline North King St widening)	\$5.0M + \$0.25M/yr ops
2006-2020			
6a.	HOV System: East Honolulu (AM peak period)	H-1 from Ainakoa Av to Kapiolani Interchange: reversible lane HOV (to connect with Kalaniana'ole Hwy HOV)	\$40.0M + \$0.25M/yr ops
6b.		H-1 at Kapiolani Interchange: construct HOV ramp to provide direct connection from H-1 contraflow HOV lane to Kapiolani BI	included above
6c.		Kapiolani BI: convert existing reversible lane operation on Kapiolani BI to HOV use only	\$1.0M
7.	HOV System: Leeward (AM & PM peak periods)	AM peak: construct H-1 HOV median lane from Makakilo Interchange to crossover Ewa of Waiawa Interchange (connects to initial Leeward HOV system described for 1995-2000)	\$61.0M [c,d]
		PM peak: construct H-1 HOV median lane from Waiawa Interchange to Makakilo Interchange (continues from initial Leeward HOV system described for 1995-2000)	included above
8.	HOV System: Moanalua (AM & PM peak periods)	Moanalua Fwy from Puuloa Rd to Middle St: construct HOV viaduct/ramp to provide direct connection from Moanalua Fwy HOV to North King St contraflow HOV	\$22.0M

Notes:

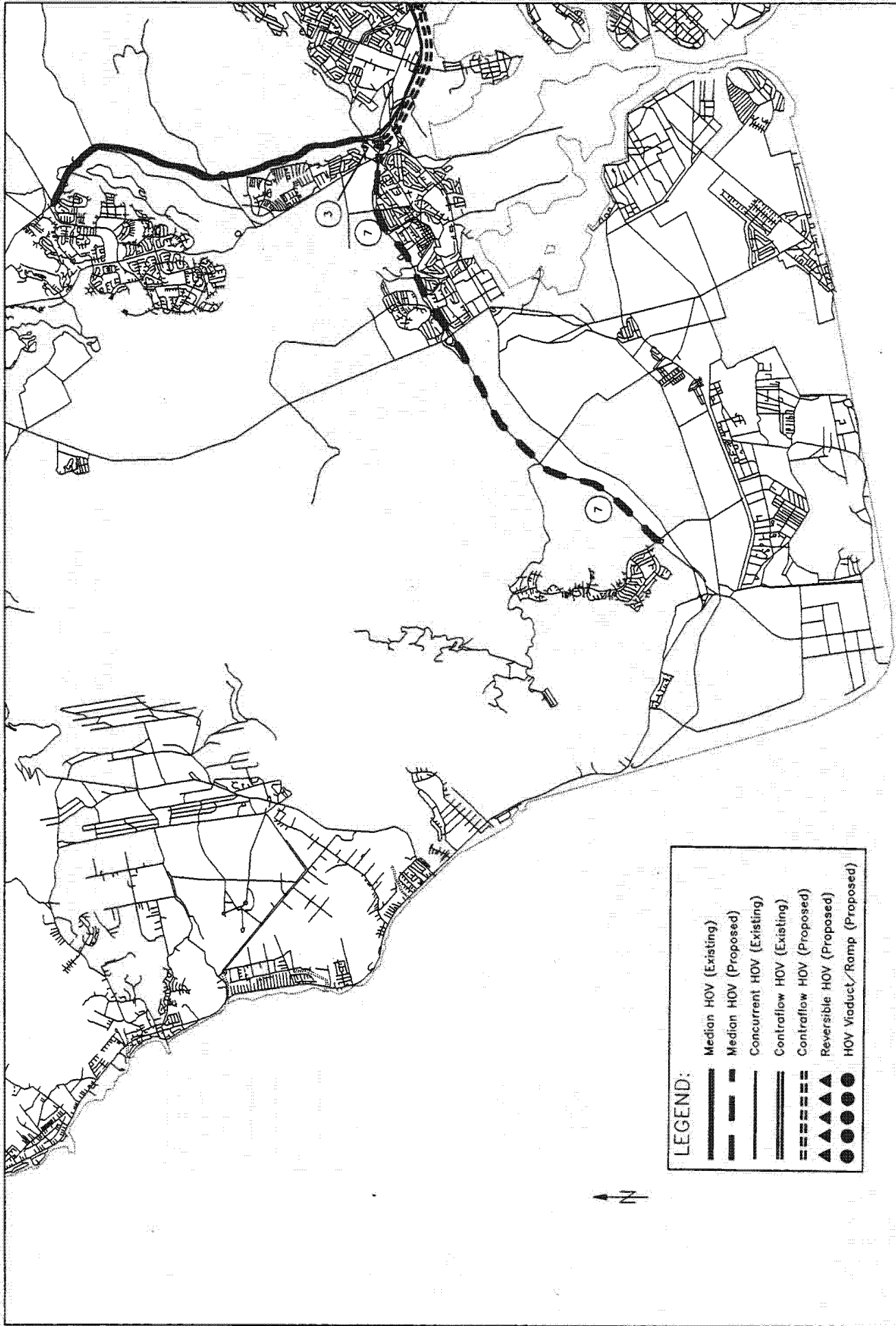
- * Denotes baseline project.
- a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction.
- b. Nimitz Highway Viaduct project costs are included in Highway Element (see Table 3-1).
- c. Improvement could be partially funded by developers.
- d. Assumes construction of new HOV lanes in H-1 median. Cost would be less if provide HOV lanes in existing shoulder.



V-15

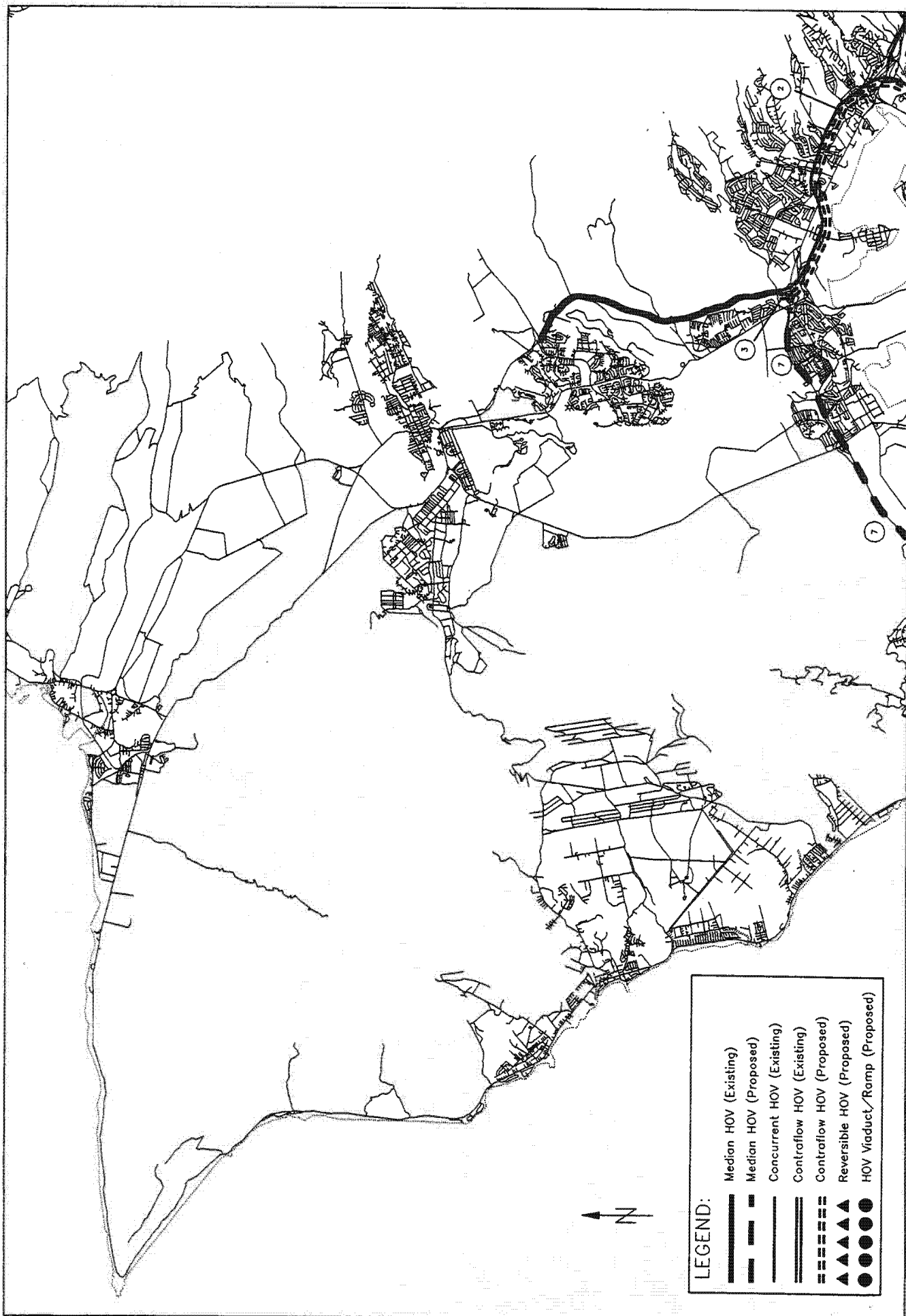
**TDM ELEMENT (HOV SYSTEM)
PRIMARY URBAN CENTER**

**FIGURE
5-2**



**FIGURE
5-3**

**TDM ELEMENT (HOV SYSTEM)
EWA/KAPOLEI**



TDM ELEMENT (HOV SYSTEM)
CENTRAL/WAIANAE

FIGURE
5-4

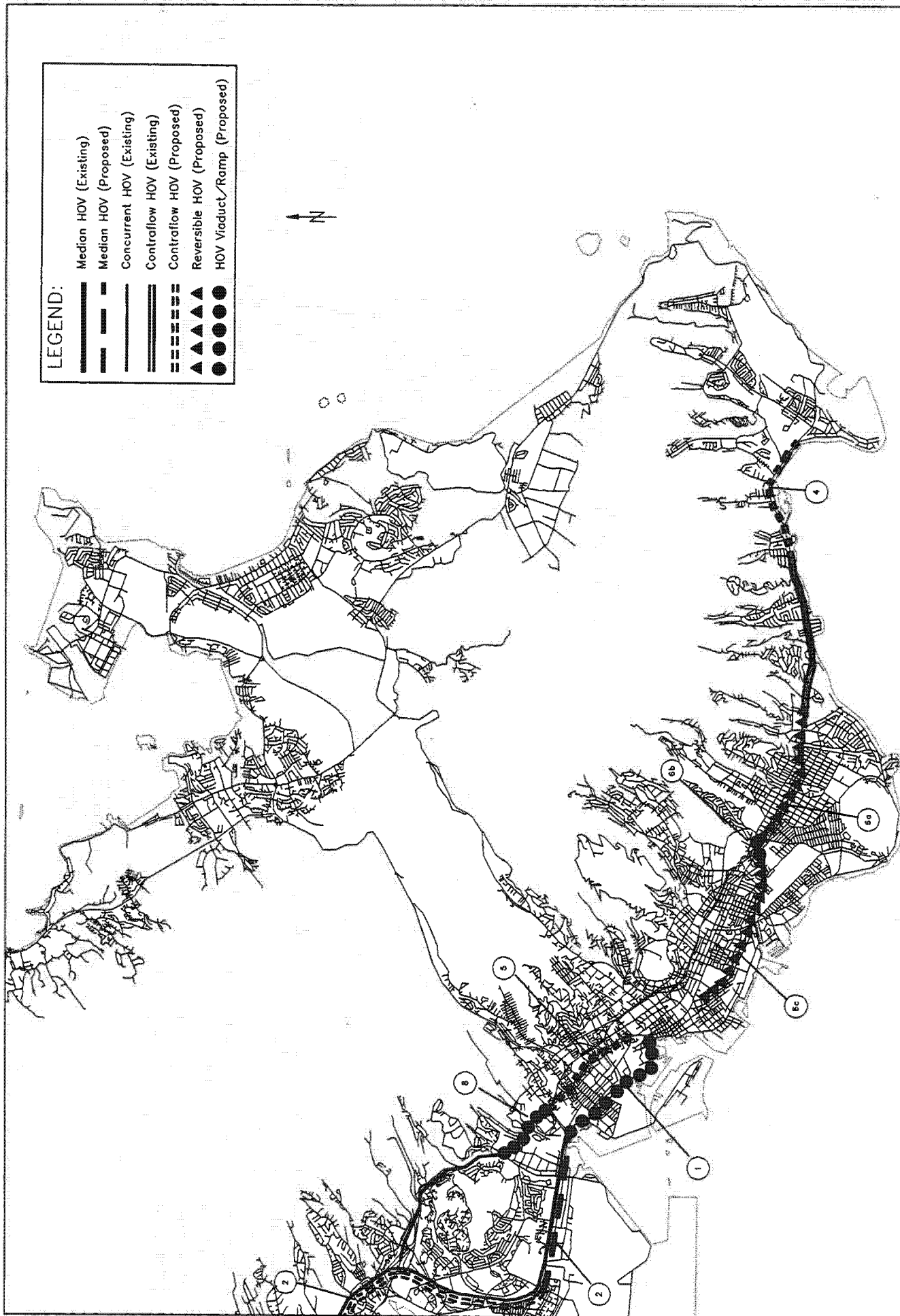


FIGURE
5-5

TDM ELEMENT (HOV SYSTEM)
WINDWARD/EAST HONOLULU

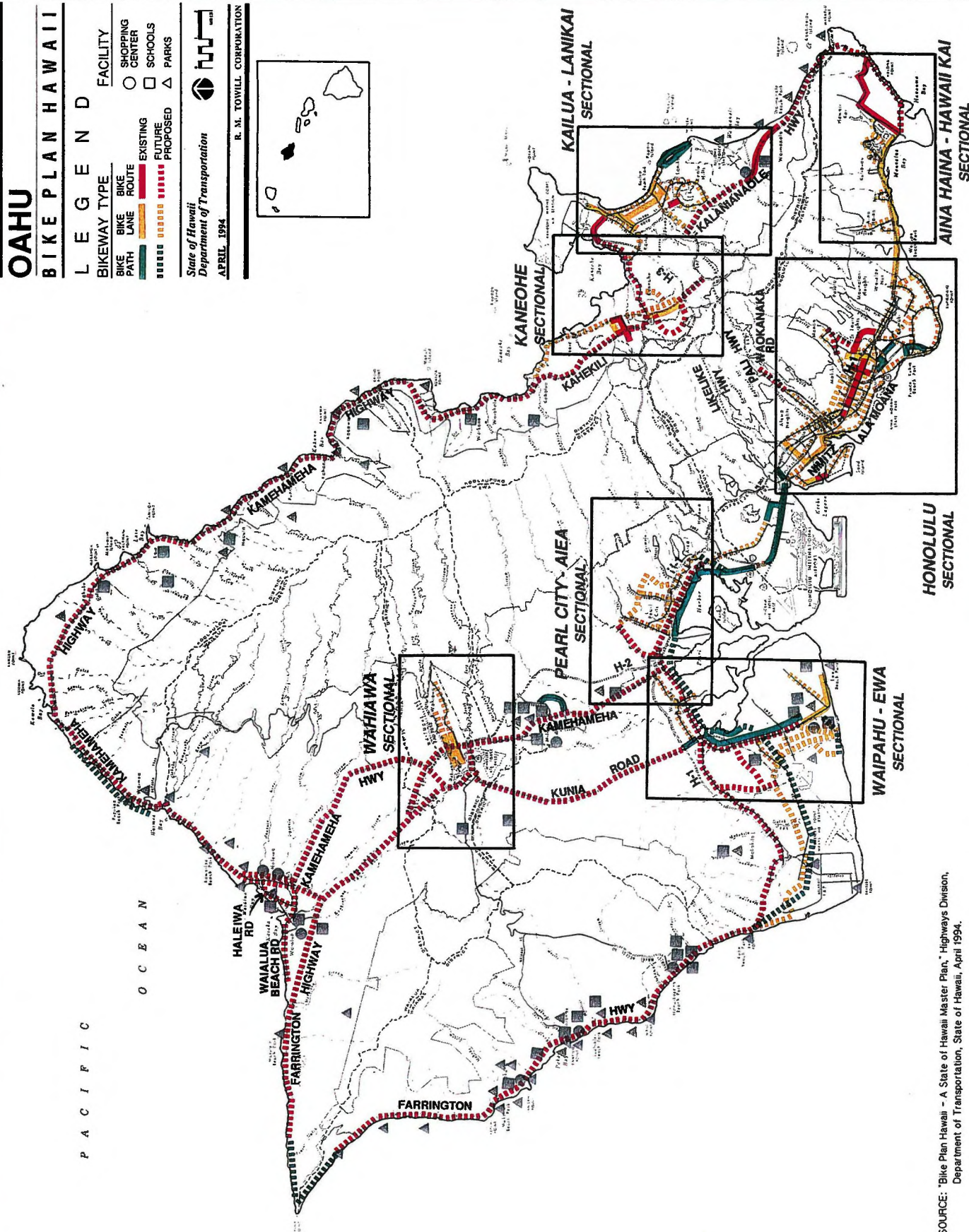
BIKE PLAN HAWAII

BIKEWAY TYPE FACILITY

○ SHOPPING CENTER
 □ SCHOOLS
 △ PARKS
 ■ BIKE PATH
 ■ BIKE LANE
 ■ BIKE ROUTE
 ■ EXISTING
 ■ FUTURE PROPOSED

**State of Hawaii
Department of Transportation
APRIL 1994**

R. M. TOWILL CORPORATION



SOURCE: "Bike Plan Hawaii - A State of Hawaii Master Plan," Highways Division, Department of Transportation, State of Hawaii, April 1994.

FIGURE 5-6
BICYCLE PLAN

VI. FINANCIAL PROGRAM

EXISTING REVENUE SOURCES

Expenditures for surface transportation on Oahu include both operating expenditures and capital expenditures. Funding sources for the program include federal grants, state funds appropriated by the Legislature, City and County funds appropriated by the City Council, and transit operating revenues.

Federal Revenue Sources

Federal revenues include portions of the Federal Fuel Tax allocated to transportation through the Highway Trust Fund and General Funds provided for transportation purposes. These sources provide funding for Interstate Maintenance, National Highway System, Bridge Replacement and Rehabilitation, Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ), Federal Transit Section 3 Discretionary, and Federal Transit Sections 3, 9 and 16(b)2 Formula programs.

Federal Highway Revenues. Federal highway revenues are allocated to the State of Hawaii, Department of Transportation (HDOT). Under Federal regulations, as a non-contiguous state, Hawaii is not bound by intrastate funding formulas to determine Oahu's share of federal highway revenues.

Federal Transit Revenues. Oahu receives all federal formula transit revenues allocated to Hawaii, except a portion of the Section 16(b)2 revenues for special transit. Section 9 operating assistance and technical and capital allocations and Section 3 formula monies are currently allocated to the City and County of Honolulu. Section 16(b)2 monies are administered by HDOT.

State of Hawaii Revenue Sources

State Highway Revenues. HDOT's Highway Division provides for roadway maintenance and construction with funding from the Highway Special Fund. The Highway Special Fund's revenues are from six primary funding sources and a miscellaneous category. The primary funding sources include:

- State Liquid Fuel Tax
- Registration Fees
- State Motor Vehicle Weight Tax
- Car Rental Vehicle Surcharge
- Tour Vehicle Surcharge
- Overweight Vehicle Surcharge

State Transit Revenues. No State funds are used for transit operations or capital projects on Oahu.

City and County of Honolulu Revenue Sources

City and County of Honolulu revenues for transportation purposes come from three primary sources, the Highway Fund and the General Fund, appropriated by the City Council, and transit operating revenues. The Highway Fund includes four major revenues sources: (1) the City and County fuel tax; (2) the motor vehicle weight tax; (3) the public utility franchise tax; and (4) a portion of the charges for services category. The General Fund includes a variety of revenue sources, with the largest being property taxes. Transit operating revenues almost entirely come from bus farebox receipts.

REVENUE PROJECTIONS AND ASSUMPTIONS

Revenue forecasts for the OMPO Regional Transportation Plan have been developed with input from federal, state and local transportation officials. Table 6-1 provides summary revenue estimates for three periods, 1995 to 2000, 2001 to 2005, and 2006 to 2020. Detailed annual revenue forecasts used in the development of this summary are included in *Product 12: Financial*

TABLE 6-1
REVENUE ESTIMATE SUMMARY
2020 OAHU REGIONAL TRANSPORTATION PLAN
(Millions of Year-of-Expenditure Dollars)

Revenue Sources	1995-2000	2001-2005	2006-2020	1995-2020 Total
OAHU'S FEDERAL REVENUES				
Highway Revenues	\$522.2	\$511.0	\$2,069.9	\$3,103.1
Transit Revenues				
Section 9 Formula Funds	\$113.1	\$101.3	\$411.6	\$626.0
Section 3 Formula Funds	\$2.8	\$2.8	\$11.2	\$16.8
Section 3 Bus Discretionary Funds	\$17.0	\$15.2	\$61.7	\$93.9
Subtotal Federal Revenues	\$655.1	\$630.3	\$2,554.4	\$3,839.8
OAHU'S STATE REVENUES				
Maintenance and Operations	\$129.2	\$115.8	\$414.0	\$659.0
Capital Improvement Program	\$78.6	\$65.7	\$236.6	\$380.9
Subtotal State Revenues	\$207.8	\$181.5	\$650.6	\$1,039.9
CITY AND COUNTY REVENUES				
Highway Fund				
Highway Maintenance and Operations	\$235.6	\$229.6	\$928.2	\$1,393.4
Transit Operations and Maintenance	\$117.8	\$114.8	\$464.1	\$696.7
Capital Projects	\$29.4	\$28.7	\$116.0	\$174.1
General Fund				
Transit Operations and Maintenance	\$438.8	\$477.7	\$2,381.1	\$3,297.6
Capital Projects	\$87.8	\$95.5	\$476.2	\$659.5
Transit Operating Revenues	\$189.3	\$219.4	\$1,250.6	\$1,659.3
Subtotal City and County Revenues	\$1,098.7	\$1,165.7	\$5,616.2	\$7,880.6
TOTAL REVENUE ESTIMATE	\$1,961.6	\$1,977.5	\$8,821.2	\$12,760.3

Plan. All revenue estimates are in escalated year-of-expenditure dollars. Assumptions used, as well as sources of information for this revenue forecast, are summarized below.

Federal Revenues

Federal Highway Revenues. Federal revenue allocations for Federal Fiscal Year 1994-95 serve as the basis for forecast revenues. Highway revenues have been assumed to grow at 3 percent per year. This is a conservative estimate of highway revenues as Federal allocations (nationwide) have increased 50 percent over the past 12 years (a rate of 3.4 percent per year). Innovative projects and Highway Planning and Research programs are grant programs and not formula based programs. These funds have been assumed to grow at 2 percent per year. Demonstration Projects have not been estimated beyond the 1995 period due to the variability of these funds.

As a non-contiguous state, Hawaii is not bound by intrastate funding formulas to determine Oahu's share of Federal highway revenues. A review of historic allocations of Federal funds based on previous STIP documents indicates no clear trend from which to base an estimate of Oahu's share of Federal highway funds. Fluctuations in annual obligations of Federal revenues by the State of Hawaii, Department of Transportation, as well as the limitations of data which indicate actual obligation levels associated with Oahu and the other islands, contribute to the absence of a clear historic trend. HDOT has recently undertaken an effort to formulate a methodology for intrastate allocation of funding which has not yet been finalized or adopted. Therefore, based on the recognized limits of the available trend data and to provide a planning-level estimate for purposes of this study, an assumption of 66 percent of Federal highway revenues was used to forecast Oahu's share.

Federal Transit Revenues. Federal transit revenues are assumed to increase at 3 percent per year, the same rate of increase as Federal highway revenues. Section 9 formula funds for technical and capital assistance are assumed to continue through 2020. Section 9 formula funds for operating assistance are assumed to continue only through 1997. Section 3 formula funds are assumed to continue through 2020.

In recent years Honolulu has not received any Section 3 discretionary funds for bus capital projects, primarily because it has been receiving Section 3 funds and earmarks for additional funds from the Rail New Start program. Since Section 3 New Start funds are no longer earmarked for Honolulu, it is assumed that Honolulu will be able to successfully compete for Section 3 Bus discretionary funds during the time period of the ORTP. During this time period it is assumed that Section 3 Bus discretionary grants will be received at a level of approximately 15 percent of the Section 9 formula funds received, consistent with the ratio of Section 3 Bus discretionary funds to Section 9 funds authorized in ISTEA.

State of Hawaii Revenues

HDOT's Highway Division provides for roadway maintenance and construction with funding from the Highway Special Fund. Year-of-expenditure revenue forecasts for the years 1994 through 2015 were provided by HDOT. Remaining forecast years were extrapolated from the previous year forecasts. Highway Special Fund revenues are used for personnel, debt service, special maintenance, motor vehicle safety office, and several other small categories. Two budget categories in the division's biennial budget (1995-1997) provide revenues for operations and maintenance on the State's road system as well as for debt service for capital improvements. Oahu's share of the State highway revenue stream is calculated from these two budget categories and is based on historic expenditures as well as estimated costs associated with the State's Capital Improvements Program (CIP). The 1995-1997 budget includes historic information from fiscal year 1993 and 1994 and forecasts to the year 2001.

HDOT prepares the State maintenance budget and aggregates total estimated maintenance improvement costs by island. Oahu's share of the State maintenance budget incorporates HDOT budget information for Fiscal Years 1995 through 2001. A 21 percent average was used to calculate state maintenance revenues for Oahu and extended through the year 2020.

HDOT does not forecast the amount of revenues for capital projects on the state highway system. The annual budget process does forecast the value of new bond issuance. Capital costs are reflected in the value of new bond issuance. HDOT established a 1995-1997 CIP with capital projects included in conjunction with recent budget hearings. Oahu's share of those

costs was calculated with resulting percentages ranging from 32 percent to 48 percent of each year's CIP. 40 percent was assumed to be the percentage of the CIP for the years 1998 through 2020.

City and County of Honolulu Revenues

City and County of Honolulu Highway Fund revenues come from four major sources: (1) the City and County fuel tax; (2) the motor vehicle weight tax; (3) the public utility franchise tax; and (4) a portion of the charges for services category. Based on past trends, the fuel tax is assumed to increase at 1.6 percent per year, while the other three sources are assumed to increase at 4 percent per year. In total, the Highway Fund is assumed to increase at an average of about 3 percent per year. Annual Highway Fund expenditures are assumed to be allocated 40 percent to highway maintenance and operations, 20 percent to transit operations and maintenance and 5 percent for capital expenditures, with the remainder used for other services such as public safety.

Based on past trends, the City and County General Fund is assumed to grow at an average 5 percent per year over the time period of the ORTP. Annual General Fund expenditures are assumed to be allocated 10 percent to transit operations and maintenance and 2 percent for capital expenditures.

Total revenues for capital projects, from the Highway Fund and the General Fund, would be allocated 75 percent to transit capital projects and 25 percent to highway capital projects based on past trends.

Transit operating revenue estimates assume a fare increase of 8.16 percent every two years for both bus and Handi-Van services, consistent with an assumed increase in operating costs of 4 percent per year. Upon implementation of a rapid transit system, a coordinated single-fare system including both rapid transit and bus services is assumed.

ISSUES

The revenue projections described above generally assume a continuation of current trends regarding the funding of transportation services and projects. In order to implement the ORTP, however, modifications to past practices will be needed in three areas: (1) the sharing of transportation funding responsibilities with developers; (2) the allocating of flexible revenues between highway and transit in accordance with needs; and (3) the seeking of alternative additional revenue sources, in particular to fund development of rapid transit.

Developer/Other Funding

Revenue sources identified in earlier sections of this chapter will not be enough to fund all of the improvements identified in this plan. Clearly, other sources of funding must be obtained. One potential source is private and public developer funding.

Certain major capital improvements in Ewa, Central Oahu, and Kakaako have been identified as potential projects to be partially or completely funded by private and public developers. These projects are listed in Table D-1 of Appendix D.

At present, commitments for developer financing of transportation improvements are derived primarily from conditions of approval for State Land Use Boundary amendments and for City zone changes as specified in unilateral agreements. The translation of these commitments to specific funding levels by developer for the transportation projects identified in this plan does not currently exist, although efforts in this area are currently underway.

Lacking these specific funding level commitments, this study assumed that up to 100 percent of these affected transportation projects will be funded by the developers. For purposes of this plan, three tiers of highway or TDM capital projects have been identified for potential developer funding:

1. Up to 100% Developer Funded - Projects that serve development and would be constructed solely to provide access to a particular developing area, and would not be constructed otherwise.

2. Up to 50% Developer Funded - Projects that mitigate anticipated impacts of future development but which would also benefit other existing or future traffic.
3. Up to 20% Developer Funded - HOV system improvements serving developer areas.

In addition to the capital improvement projects, it was assumed that employer/developer membership fees would cover 50 percent of the operating costs for the Transportation Management Associations proposed in the TDM element of the plan, and that developers would fund implementation of park-and-ride lots serving the developing areas. The actual employer/developer participation will be determined outside of the ORTP effort.

Although these developer funds could total more than \$1.1 billion over the life of the plan (in escalated year-of-expenditure dollars), it is not the intent of this three-tiered approach to establish a developer's funding obligation or commitment. This will be determined on a project-by-project basis through future studies and negotiations outside of the ORTP effort. The three-tiered approach is used to estimate the potential developer-generated revenues for regional planning purposes, as required under federal regulations. It should be noted that the identification of developer funds for these projects does not preclude the future consideration by the metropolitan planning process in programming other available public and private funds. Federal assistance will be sought for all eligible projects. Eligible projects include those projects that have fulfilled the requirements of the metropolitan and statewide planning processes.

In order to obtain developer participation in the transportation improvements, the State and City are considering several methods of financing, including community facility districts, user fees, and impact fees. With the assumed levels of developer participation, the financing plan is estimated to result in a small positive cash balance in the Year 2020. However, it should be noted that, if the developer financing share proves to be less than the assumed levels, other financing opportunities will be identified in the subsequent update of the regional plan.

Revenue Shift to Transit

The ORTP's mix of projects assumes that a greater portion of flexible revenues would be allocated to transit than would be the case following historical trends, with transit receiving

approximately \$369 million more than its historical share over the entire life of the plan. Since City and County revenue sources are distributed between highway and transit projects already, part of this could be achieved by modifying the allocation of these sources. It might also be possible to direct a portion of the projected available flexible Federal transportation revenues, such as Surface Transportation Program or Congestion Mitigation/Air Quality funds, to transit.

Alternative Revenue Sources

The ORTP includes a rapid transit system on an exclusive right-of-way in the PUC corridor. Current funding sources would not be adequate to construct and operate this system. Potential new funding sources for the rapid transit system could include Federal discretionary capital funds, increases in the gas tax and vehicle registration fees, and an excise tax surcharge. The actual funding sources for this or any transportation project would be identified during subsequent detailed implementation planning studies and evaluations.

COSTS COMPARED TO REVENUES

Table 6-2 summarizes the project revenues and costs for the ORTP. The individual project cost estimates presented in Chapters III, IV and V for the Highway, Transit and Transportation Demand Management Elements, respectively, were escalated to future year-of-expenditure dollars assuming an inflation rate of 4 percent, and were aggregated. As can be seen, overall costs to implement the plan are estimated at approximately \$17.9 billion (in year-of-expenditure dollars) over the entire 26-year plan period.

Projected revenues slightly exceed the estimated costs, resulting in slight surpluses for each of the three plan periods. The revenue forecasts include continuation of traditional Federal, State, and City and County funding sources plus anticipated developer contributions, Federal Section 3 discretionary bus funds, and new revenue sources for the rapid transit system.

TABLE 6-2
ESTIMATED REVENUE AND COST SUMMARY
2020 OAHU REGIONAL TRANSPORTATION PLAN
(Millions of Year-of-Expenditure Dollars)

HIGHWAY AND TDM ELEMENTS				
	1995-2000	2001-2005	2006-2020	Total
REVENUES				
Federal [a]	\$522.2	\$511.0	\$2,069.9	\$3,103.1
State M&O Revenues	\$129.2	\$115.8	\$414.0	\$659.0
State Capital Revenues	\$78.6	\$65.7	\$236.6	\$380.9
C&C Highway Fund Revenues to M&O	\$235.6	\$229.6	\$928.2	\$1,393.4
C&C Capital Funds-Highway Share [b]	\$29.3	\$31.1	\$148.1	\$208.5
Developer Funding [c]	\$152.4	\$92.9	\$858.8	\$1,104.1
Revenue Shift (to)/from Transit [d]	(\$30.3)	(\$50.5)	(\$288.0)	(\$368.8)
Total Revenues	\$1,117.0	\$995.6	\$4,367.6	\$6,480.2
COSTS				
Highway Element M&O Costs	\$427.8	\$489.9	\$2,377.1	\$3,294.8
TDM Element M&O Costs	\$28.4	\$55.6	\$261.2	\$345.2
Highway Element Capital Costs	\$609.6	\$381.4	\$1,354.5	\$2,345.5
TDM Element Capital Costs	\$49.7	\$62.7	\$320.8	\$433.2
Total Costs	\$1,115.5	\$989.6	\$4,313.6	\$6,418.7
BALANCE	\$1.5	\$6.0	\$54.0	\$61.5

TRANSIT ELEMENT				
	1995-2000	2001-2005	2006-2020	Total
REVENUES				
Federal Section 9 Formula Funds	\$113.1	\$101.3	\$411.6	\$626.0
Federal Section 3 Formula Funds	\$2.8	\$2.8	\$11.2	\$16.8
Federal Section 3 Discretionary Funds [e]	\$17.0	\$15.2	\$61.7	\$93.9
Federal Subtotal	\$132.9	\$119.3	\$484.5	\$736.7
HPTA Operating Revenues [f]	\$189.3	\$219.4	\$1,062.4	\$1,471.1
Rapid Transit Operating Revenues	\$0.0	\$0.0	\$188.2	\$188.2
New Rapid Transit Revenues [g]	\$0.0	\$0.0	\$4,098.9	\$4,098.9
C&C Capital Funds-Transit Share [b]	\$87.9	\$93.2	\$444.2	\$625.3
C&C Revenues for Transit O&M [b]	\$556.6	\$592.5	\$2,845.2	\$3,994.3
Revenue Shift (to)/from Highways [d]	\$30.3	\$50.5	\$288.0	\$368.8
Total Revenues	\$997.0	\$1,074.9	\$9,411.4	\$11,483.3
COSTS				
Bus System O&M Costs [f]	\$779.4	\$903.4	\$4,431.5	\$6,114.3
Rapid Transit O&M Costs	\$0.0	\$0.0	\$1,061.9	\$1,061.9
Bus System Capital Costs [f]	\$217.6	\$171.5	\$692.8	\$1,081.9
Rapid Transit Capital Costs	\$0.0	\$0.0	\$3,225.2	\$3,225.2
Total Costs	\$997.0	\$1,074.9	\$9,411.4	\$11,483.3
BALANCE	\$0.0	\$0.0	\$0.0	\$0.0

PLAN TOTAL				
	1995-2000	2001-2005	2006-2020	Total
REVENUES	\$2,114.0	\$2,070.5	\$13,779.0	\$17,963.5
COSTS	\$2,112.5	\$2,064.5	\$13,725.0	\$17,902.0
BALANCE	\$1.5	\$6.0	\$54.0	\$61.5

Notes:

- a. Oahu's share of statewide federal allocation assumed at 66%.
- b. Includes both Highway Fund & General Fund revenues.
- c. Assumes developer funding for selected projects.
- d. C&C or Federal (CMAQ or STP) flexible revenue shifts to balance highway & transit elements.
- e. Assumes Federal Section 3 discretionary funding at approximately 15% of level of Section 9 formula funding.
- f. Assumes 715-vehicle bus fleet & 125-vehicle Handi-Van fleet.
- g. Potential rapid transit funding sources include federal discretionary transit capital funds, gas tax & vehicle registration fee increases, & an excise tax surcharge.

Highway and TDM Elements

As shown on Table 6-2, the highway and TDM elements of the plan have a total cost estimated at approximately \$6.4 billion, including about \$2.8 billion in capital costs and \$3.6 billion in maintenance and operating costs. These cost estimates are based on the use of unit costs for similar current projects.

Slightly less than half (about 45 percent) of the total projected highway and TDM revenues (before additional revenue shifts to transit) are assumed to come from Federal funds. Approximately 15 percent are anticipated to come from State funds, 23 percent from City and County funds, and 16 percent from developer contributions.

Transit Element

The transit element of the plan has a total cost estimated at almost \$11.5 billion, including about \$4.3 billion in capital costs (\$3.2 billion for rapid transit) and about \$7.2 billion in operating and maintenance costs (\$1.1 billion for rapid transit).

Approximately 6 percent of the projected transit revenues are assumed to come from Federal funds and about 40 percent are anticipated to come from City and County funds; no State contribution to transit is assumed. About 14 percent of total transit revenues are anticipated to come from operating (primarily farebox) sources, with the operating revenues amounting to about 23 percent of projected operating costs. Approximately 3 percent of the transit revenues would be obtained via the additional shift of flexible revenues from highway revenues. Approximately 36 percent of the transit revenues would be required from new sources in order to construct and operate the rapid transit system.

VII. REGIONAL TRANSPORTATION PLAN IMPLEMENTATION

The Oahu Regional Transportation Plan identifies short-range and long-range strategies and actions that will lead to the development of an integrated intermodal transportation system. It serves to guide the eventual implementation of the major surface transportation facilities and programs that help to achieve the goals and objectives of the plan. The adoption of the Oahu Regional Transportation Plan by the OMPO Policy Committee signifies the official acceptance of the document.

The next steps involve the submission of the ORTP to the State of Hawaii so that it can be integrated into the Statewide Transportation Plan, and submission of the ORTP to the Federal Department of Transportation so that it can be certified as the document that identifies the 20-year program of improvements eligible for federal transportation funds. Both steps are the responsibility of OMPO. Additional issues to which attention must be given include consideration of projects that may require major investment studies, coordination with NEPA and Section 404 of the Clean Water Act procedures, and additional activities required by the various relevant agencies.

MAJOR INVESTMENT STUDIES

Current legislation that administers the use of Federal transportation funds provides that a major investment study (MIS) must be prepared for each project which has been identified as a major metropolitan transportation investment and for which Federal funds are potentially involved. The appropriate sections of the federal regulations (Title 23, Part 450, Section 450.104 of the Code of Federal Regulations) define a major metropolitan transportation investment as a "high-type highway or transit improvement of substantial cost that is expected to have a significant effect on capacity, traffic flow, level of service, or mode share at the transportation corridor or subarea scale." It further states that examples of such improvements include, but are not limited to:

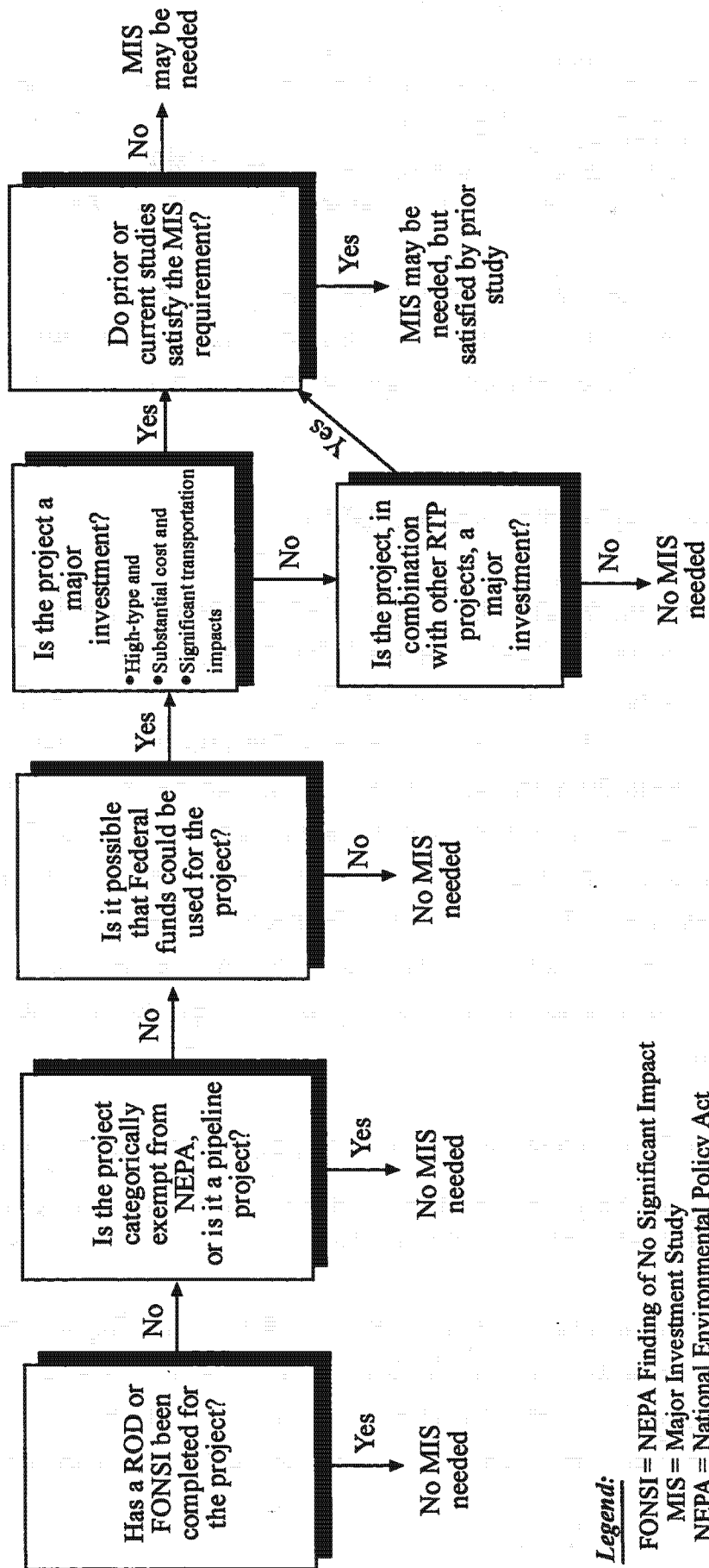
- Construction of a new partially controlled access principal arterial (access allowed only for public roads)
- Extension of an existing partially controlled access principal arterial (access allowed only for public roads) by one or more miles
- Capacity expansion of a partially controlled access principal arterial (access provided only for public roads) by at least one lane through widening or an equivalent increase in capacity produced by access control or technological improvement
- Capacity expansion or extension of a high occupancy vehicle (HOV) facility or a fixed guideway transit facility by one or more miles
- Addition of lanes or tracks to an existing fixed guideway transit facility for a distance of one or more miles
- A substantial increase in transit service on a fixed guideway facility

The Federal regulations also indicate that project that are generally not considered to be major transportation investments include, but are not limited to:

- Highway projects on principal arterials where access is not limited to public roads only
- Small scale improvements or extensions (normally less than one mile) on principal arterials with the primary goal of relieving localized safety or operational difficulties
- Resurfacing, replacement, or rehabilitation of existing principal arterials and equipment
- Highway projects not located on a principal arterial
- Changes in transit routing and scheduling

OMPO intends to formulate final MIS screening procedures through a public process later in 1995. However, for the purposes of the ORTP, Figure 7-1 illustrates an interim screening flowchart which has been developed to determine whether a project in the ORTP should or should not generate the need for a major investment study. Application of this process to the ORTP suggests that a total of nine projects may require the preparation of an MIS. These projects are:

- Ewa North-South Road (S19)
- Fort Weaver Road/Kunia Road widening from H-1 to Renton Road (S20)
- Kalaniana'ole Highway widening from Castle Junction to Kailua Road (S22) and from Kailua Road to Keolu Drive (S34)



Legend:

FONSI = NEPA Finding of No Significant Impact
 MIS = Major Investment Study
 NEPA = National Environmental Policy Act
 ROD = NEPA Record of Decision
 RTP = Regional Transportation Plan

Figure 7-1
Interim Major Investment Study Screening Process

- Farrington Highway widening from H-1 to Nanakuli (S31)
- Kamehameha Highway widening from Ka Uka Boulevard to Lanikuhana Avenue (S39)
- Central East-West Road (C18)
- Central Mauka Road (C19)
- Rapid Transit on Exclusive ROW in PUC Corridor
- H-1 HOV Median Lanes from Makakilo Interchange to Waiawa Interchange

It should be recognized that these projects as described are serving as placeholders in the ORTP, with future refinements to the project description, potentially through evaluation of alignment, operational and modal alternatives, occurring through further study in the MIS process.

NEPA AND SECTION 404 COORDINATION

In a May 1992 agreement, the U.S. Department of Transportation, the U.S. Department of Army-Civil Works, and the U.S. Environmental Protection Agency (EPA) adopted as agency policy: (1) improved interagency coordination; and (2) integration of National Environmental Policy Act (NEPA) and the Clean Water Act Section 404 procedures. Locally, a memorandum of understanding (MOU) was signed by the U.S. Department of Army Corps of Engineers, U.S. Fish and Wildlife Service (FWS)/National Marine Fisheries Service (NMFS), EPA, Federal Highway Administration (FHWA)/Federal Transit Administration (FTA), Hawaii State Department of Transportation (HDOT), and the Oahu Metropolitan Planning Organization to implement this policy. The signatories of this MOU have agreed to integrate NEPA and Section 404 of the Clean Water Act in transportation planning and project development stages. OMPO has agreed, as part of this MOU, to:

- a. Address waters of the U.S. and associated sensitive species in the ORTP.
- b. Request federal regulatory/resource agencies to review and comment on the ORTP and associated environmental analyses.

In conformance with this MOU, OMPO provided the Corps of Engineers a copy of the draft ORTP for their review and comments. The Corps provided comments on each of the relevant projects, identifying projects for which there may be a need for additional information, identifying those which may require additional review when specific routes have been developed, and those which

do not affect any waterways. All comments from the Corps of Engineers are provided in Appendix E.

ACTIONS AND RESPONSIBILITIES

The following summarizes future actions that are necessary to ensure that the ORTP will function in the manner designated by ISTEA and to enable the specific projects identified in the plan to be implemented.

1. OMPO and its participating agencies must ensure that the travel demand forecasting tools are maintained and upgraded as necessary to satisfy federal planning requirements and the planning needs of this community. It should be noted that OMPO has engaged the services of a consultant that is currently involved in the development of a "best practice" travel demand forecasting model for Oahu that satisfies the goals and objectives of the surface transportation planning process for the island. This new package of programs should be available for use for the next update of the ORTP.
2. OMPO and its participating agencies should ensure that periodic updates of the socioeconomic data used to develop travel demand forecasts are conducted to ensure that the changes in development patterns and policies are properly reflected in the transportation plan. These updates should occur at least every five years and at times when major changes in anticipated growth and development occur.
3. The City and County Department of Transportation Services should annually update the Short-Range Transportation Plan and provide these updates to OMPO. These updates should be reviewed and used as the basis for assessing the need to update the City's portions of the ORTP.
4. HDOT should develop and implement the federally-required Management Systems (development of these systems is currently underway).
5. OMPO and its participating agencies should review the Management Systems to ensure that their products are properly reflected in the ORTP.
6. OMPO and its participating agencies should ensure that the projects and programs identified in the Oahu Transportation Improvement Program are consistent with the ORTP.
7. HDOT should finalize the statewide transportation enhancements program procedures and proposed enhancement activities should be incorporated, as appropriate, into the ORTP.
8. OMPO, HDOT, and DTS should work to identify and implement the necessary elements and assist in the passage of necessary legislation to ensure that Oahu's Transportation Demand Management program can successfully achieve its goals.

1. The first part of the document is a list of the names of the persons who were present at the meeting.

2. The second part of the document is a list of the names of the persons who were absent from the meeting.

3. The third part of the document is a list of the names of the persons who were present at the meeting.

4. The fourth part of the document is a list of the names of the persons who were absent from the meeting.

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APPENDIX A

ORTP PROJECTS AND PROGRAMS BY TIME PERIOD

TABLE A-1a
HIGHWAY ELEMENT, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
STATE PROJECTS				
S27.	Interstate H-1	Kapolei Interchange	Construct new interchange per Ewa Master Plan	\$19.0M [b]
S1.	Interstate H-1*	Kunia Interchange	Improve interchange: <ul style="list-style-type: none"> • Widen EB on-ramp to 3 lanes • Relocate existing WB on-ramp & construct new 2-lane WB to SB loop off-ramp • Widen Fort Weaver Rd to add 1 SB lane from loop ramp to Farrington Hwy • Widen Kunia Rd to divided 4 lane plus NB auxiliary lane from H-1 to Kupuna Loop 	\$8.2M
S2.	Interstate H-1	Makakilo Interchange	Improve existing interchange per Ewa Master Plan	\$4.0M [b]
S4.	Interstate H-1*	Pali Hwy eastbound off-ramp	Add 3rd lane to existing off-ramp to increase storage at signal (under construction)	n/a [a]
S5.	Interstate H-2*	Mililani Interchange	Improve interchange: <ul style="list-style-type: none"> • Relocate existing SB off-ramp • Construct new WB to SB loop on-ramp 	\$7.2M [b]
S6.	Interstate H-2*	Waipio Interchange	Improve interchange: <ul style="list-style-type: none"> • Construct new WB to SB loop on-ramp • Widen existing NB off-ramp • Widen Ka Uka BI bridge 	\$16.0M [b]
S7.	Interstate H-3*	Halawa Interchange to Kamehameha Hwy	New 4-lane freeway (under construction)	n/a [a]
S8.	Farrington Hwy*	Ala Hema St toward Jade St	Widen to 4 lanes (under construction)	\$5.6M [a]
S9.	Farrington Hwy	Nanakuli, Maili, Waianae, Makaha	Safety & operational improvements (e.g., sidewalks, signalized pedestrian crosswalks or bridges, continuous left-turn lanes)	\$21.5M
S10.	Fort Barrette Rd	H-1 to Kapolei Pkwy	Widen to 4 lanes per Ewa Master Plan	\$7.0M [b]
S11.	Kahekili Hwy*	Likelike Hwy to Haiku Rd	Widen to 6 lanes from Likelike Hwy to Kahuhipa St; widen to 5 lanes (3 inbound & 2 outbound) from Kahuhipa St to Haiku Rd (under construction)	\$3.6M [a]
S13.	Kamehameha Hwy*	Waipio Uka St to Ka Uka BI	Widen to 4 lanes	\$5.2M [a]
S23a.	Kunia Rd	H-1 Kunia Interchange to Royal Kunia	Widen Kunia Rd to 4 lanes; widen H-1 Kunia IC NB off-ramp to 2 lanes	\$5.5M [b]

TABLE A-1a (continued)
HIGHWAY ELEMENT, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
S25.	Nimitz Hwy Viaduct*	Keehi Interchange to Awa Street	<ul style="list-style-type: none"> Construct 2-lane viaduct from Keehi Interchange to Pacific St (1 lane HOV & 1 lane general purpose) Reversible operation (2 lanes inbound in AM peak, 2 lanes outbound in PM peak) Widen inbound Nimitz Hwy from Pacific St to Awa St to provide left-side HOV lane at-grade 	\$197.6M + \$0.25M/yr ops
S14.	Pali Hwy*	Castle Junction	Construct interchange	\$28.0M
S15.	Puuloa Rd*	Kamehameha Hwy to Salt Lake Bl	Widen to 4 lanes	\$9.4M [a]
S16.	Sand Island Parkway*	Sewage Treatment Plant to Sand Island Park	Widen to 4 lanes (under construction)	\$3.8M [a]
S26.	Ward Av	Ala Moana Bl to Keawe St	Extend Ward Av to Keawe St via Ilalo St (HCDA project)	\$40.1M [b]
S43.	Incident management	Major freeways and highways	Implementation of incident management measures to be determined through ITS study	\$3.0M
CITY PROJECTS				
C2.	Farrington Hwy*	Kalaheo Rd to Fort Weaver Rd	Widen to 4 lanes	\$26.0M [b]
C3.	Kalia Rd*	Ala Moana Bl to Saratoga Rd	Provide 2 additional lanes within new 84' R/W	\$19.0M
C4.	Kapiolani Bl*	Atkinson Dr to Hauoli St	Widen to 8 lanes & other improvements for Honolulu Convention Center	\$5.0M [b]
C5.	Kapolei Pkwy	Ko Olina to Ewa North-South Rd	Construct new road per Ewa Master Plan	\$37.0M [b]
C6.	Liliha St	H-1 to King St	Widen to 6 lanes	\$5.0M
C7.	Moanalua Rd*	Aiea Heights Dr to Aiea Interchange	Widen to 4 lanes	\$5.0M [a]
C8.	Philip St*	Kalakaua Av	Provide double left-turn lanes onto Kalakaua Av	n/a [a]
C9.	Salt Lake Bl*	Kahuapaani St to Ala Liliroi St	Widen to 4 lanes	\$18.6M
C10.	Waianae Coast Mauka Emergency Access Route	Nanakuli to Makaha, along alignment generally following Luaiualei Naval Rd, Fence Rd, Waianae Homestead Rd, Plantation Rd, & new road mauka of Ala Hema St & Mahinaau Rd	Provide emergency access route by constructing new connecting sections (Fence Rd to Waianae Homestead Rd, Plantation Rd to Kaulawaha Rd mauka of Ala Hema St & Mahinaau Rd)	\$28.8M
C11.	Ward Av*	Beretania St to Kinau St	Widen to 5 lanes	\$1.5M

TABLE A-1a (continued)
HIGHWAY ELEMENT, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
FEDERAL PROJECTS				
F1.	Ford Island Access Rd*	Ford Island to Kamehameha Hwy	Construct new 2-lane causeway intersecting Kamehameha Hwy at-grade opposite inbound Salt Lake Bl	n/a (100% Federal funding)

Notes:

* Denotes baseline project.

- a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction. For projects currently underway, represents estimated remaining unencumbered cost to complete (i.e., does not include awarded, obligated or spent funds).
- b. Improvement could be partially or fully funded by developers.

TABLE A-1b
TRANSIT ELEMENT, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Improvement	Description	Estimated Cost [a]	Comments
Increased Bus Fleet & Service Levels	Bus fleet enlarged to ~715 vehicles by 2006 (could be combination of increases in TheBus service & private operators)	\$110.9M + O&M [b]	estimated acquisition costs 1995-2000
Increased Handi-Van Fleet	Handi-Van fleet increased to ~125 vehicles by 2006	\$11.3M + O&M [c]	estimated acquisition costs 1995-2000
New or Expanded Bus System Base Facilities	Halawa bus facility improvements	\$5.0M	
	Kalihi-Palama bus facility improvements	\$2.7M	
	Pearl City Junction or Manana Storage bus maintenance facility	\$29.0M	
	Handi-Van maintenance facility	\$14.9M	
Bus-Only Facilities	Kalaniana'ole Hwy to East Honolulu (express bus facility as exclusive lanes or shared in HOV lane; AM peak inbound & PM peak outbound)	\$0.15M/yr O&M	
Bus Signal Preemption	Express bus routes (specific routes and/or signals to be identified through future study)	\$3.0M + \$0.9M/yr O&M	
Park-and-Ride Lots	(see TDM Element)	(see TDM Element)	
Transit Centers/ Intermodal Terminals	Aala Park	\$0.2M	
	Alapai Terminal	\$2.1M	
	Pearlridge Shopping Center	\$0.1M	
	University of Hawaii Manoa	\$0.1M	
TheBus Equipment & Special Programs	Electronic fareboxes	\$0.5M	
	Automated vehicle monitoring	\$3.4M	
	Radio system enhancement	\$1.2M	
	Management information program	\$0.5M	
	Tow wrecker	\$2.6M	
Bus Stop Site Improvements	Bus bays, pads, shelters, benches, ADA improvements, etc.	\$1.8M	
New Service Types (subject to future study)	<ul style="list-style-type: none"> • Jitneys • Subscription bus services • Shared-ride taxi • Local circulators & shuttles 	assume included in bus fleet costs	subject to future study

Notes:

- a. All cost estimates in millions of 1994 dollars.
- b. Bus acquisition costs assume 12-year vehicle replacement cycle. Costs could vary depending upon extent to which future services are provided by private operators.
- c. Handi-Van acquisition costs assume 5-year replacement cycle.

TABLE A-1c
TRANSPORTATION DEMAND MANAGEMENT ELEMENT, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Type of Measure	Description	Estimated Cost [a]	Comments
HOV Facilities	(see Table A-1d)	(see Table A-1d)	
HOV Facility Enforcement	Enforce HOV lane vehicle occupancy requirements & raise HOV minimum occupancy threshold to 3 persons per vehicle as necessary	\$0.75M/yr enforcement	
Park-and-Ride Lots	Kapolei Village	\$2.7M [d]	
	Royal Kunia	[e]	
Rideshare Programs	<ul style="list-style-type: none"> • Matching services • Preferential carpool/vanpool parking • Guaranteed ride home programs 	[b] [c] [b]	
Work Behavior Changes	<ul style="list-style-type: none"> • Encourage telecommuting • Encourage flexible work hours • Encourage compressed work weeks 	[c] [c] [c]	
Public Transit Support	<ul style="list-style-type: none"> • Transit pass subsidies • Public transit marketing 	[c] [b]	
Transportation Management Associations (TMAs) for geographic areas	<ul style="list-style-type: none"> • Honolulu CBD • Kapiolani/Ala Moana • University • Waikiki 	\$1.2M/yr total (\$0.3M/yr each) [d]	4 TMAs formed in first period
Trip Reduction Ordinance	<p>Ordinance mandating preparation & implementation of trip reduction plans by developers & employers:</p> <ul style="list-style-type: none"> • Establish trip reduction targets • Allow flexibility in plan elements (encourage rideshare programs, parking management, work behavior, TMA participation) 	\$5.0M/yr monitoring & enforcement	
Bicycle Facilities	New bike routes, bike lanes & bike paths per <i>Bike Plan Hawaii</i> Master Plan	\$11.8M [d]	
	Additional bikeways proposed per <i>Kapolei Area Bikeway Plan</i>	[c]	concurrent with development
	Include new bikeways in Central Oahu development plans	[c]	concurrent with development
	Bicycle lockers & showers at employment centers & public multi-modal transit centers	[c]	
Pedestrian Facilities/Walkways	City of Kapolei pedestrian system	[c]	concurrent with development

TABLE A-1c (continued)
TRANSPORTATION DEMAND MANAGEMENT ELEMENT, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Type of Measure	Description	Estimated Cost [a]	Comments
Pedestrian Facilities/ Walkways (continued)	Waikiki Master Plan sidewalk improvements	\$11.8M	per MP schedule

Notes:

- a. All cost estimates in millions of 1994 dollars.
- b. Included in estimated TMA costs.
- c. Costs borne by employers and/or developers.
- d. All or portion of costs could be borne by employers and/or developers.
- e. Funds already encumbered.

TABLE A-1d
TDM ELEMENT - HOV FACILITIES, 1995-2000 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Location	Description	Estimated Cost [a]
1.	HOV System: Central (AM peak period)	AM peak operation: <ul style="list-style-type: none"> • H-2 inbound HOV lane from Mililani Interchange to Waiawa Interchange • continues as existing H-1 inside HOV lane from Waiawa Interchange to Keehi Interchange • connects to Nimitz Hwy Viaduct HOV facility* 	existing existing [b]
2.	HOV System: Leeward (AM & PM peak periods)	AM peak operation: <ul style="list-style-type: none"> • H-1 contraflow/median shoulder lane from Waiawa Interchange to Keehi Interchange*: <ul style="list-style-type: none"> - HOV lane begins at crossover Ewa of Waiawa Interchange to contraflow HOV lane through Waiawa Interchange - contraflow lane from Waiawa Interchange to Pearl Harbor Interchange (removing 2 outbound lanes while in operation) - median shoulder lane from Pearl Harbor Interchange to Keehi Interchange • connects to Nimitz Hwy Viaduct HOV facility* 	\$17.0M + \$0.25M/yr ops [b]
1.		PM peak operation: <ul style="list-style-type: none"> • Nimitz Hwy Viaduct HOV facility* to Keehi Interchange • continues as existing H-1 HOV inside lane from Keehi Interchange to Waiawa Interchange 	[b] existing

Notes:

* Denotes baseline project.

a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction.

b. Nimitz Highway Viaduct project costs are included in Highway Element (see Table A-1a).

TABLE A-2a
HIGHWAY ELEMENT, 2001-2005 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
STATE PROJECTS				
S3.	Interstate H-1*	Middle St to Kapiolani Interchange	Operational & safety improvements	\$7.0M
S17.	Interstate H-1	Palailai Interchange	Improve existing interchange per Ewa Master Plan	\$3.1M [b]
S18.	Interstate H-1	Waiawa Interchange	Improvements to relieve congestion at interchange	\$7.3M
S19.	Ewa North-South Rd*	H-1 to Papipi Rd	New mauka-makai roadway & interchange with H-1 per Ewa Master Plan	\$24.5M [b]
S20.	Fort Weaver Rd/Kunia Rd	H-1 to Renton Rd	Widen to 6 lanes per Ewa Master Plan	\$16.1M [b]
S33.	Kahekili Hwy*	Likelike Hwy Interchange	Construct interchange	\$56.3M
S21.	Kalaheoia Bl corridor	H-1 to business/industrial park	Provide 7 to 8 lanes in corridor per Ewa Master Plan	\$15.5M [b]
S22.	Kalaniana'ole Hwy	Kailua Rd to Castle Junction	Widen to 6 lanes	\$39.0M
S38.	Kamehameha Hwy	Castle Junction to H-3	Widen to 6 lanes	\$6.5M
S23b.	Kunia Rd	H-1 to Royal Kunia	Widen to 6 lanes	\$11.0M [b]
S24.	Sand Island Access Rd	Auiki St to Nimitz Hwy	Widen to 6 lanes	\$3.8M
S43.	Incident management	Major freeways and highways	Continued implementation of incident management measures to be determined through ITS study	\$1.0M
CITY PROJECTS				
C12.	Kamehameha Hwy*	Haiku Rd to Ipuka St	Widen to 4 lanes	\$4.6M
C13.	Kaukonahua Rd*	Mauka of Thompson Corner	Minor safety improvements (realignment of horizontal curves)	\$0.6M
C14.	King St*	Middle St to Liliha St	Widen to 6 lanes	\$40.1M
C15.	Puuhale Rd*	Nimitz Hwy to Dillingham Bl	Widen to 4 lanes	\$16.0M
C27.	Waipahu St	Kamehameha Hwy to Waipahu Depot St	Widen to 4 lanes (Kamehameha Hwy to Paiwa St) and/or add turn lanes, bus pull-out lanes, etc.	\$15.0M

Notes:

* Denotes baseline project.

a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction. For projects currently underway, represents estimated remaining unencumbered cost to complete (i.e., does not include awarded, obligated or spent funds).

b. Improvement could be partially or fully funded by developers.

TABLE A-2b
TRANSIT ELEMENT, 2001-2005 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Improvement	Description	Estimated Cost [a]	Comments
Increased Bus Fleet & Service Levels	Bus fleet enlarged to ~715 vehicles by 2006 (could be combination of increases in TheBus service & private operators)	\$92.1M + O&M [b]	estimated acquisition costs 2001-2005
	Additional service added outbound from Waiawa to Kapolei & Central Oahu areas	included in above	
	Additional service added within/between Kapolei & Central Oahu areas	included in above	
Increased Handi-Van Fleet	Handi-Van fleet increased to ~125 vehicles by 2006	\$8.8M + O&M [c]	estimated acquisition costs 2001-2005
New or Expanded Bus System Base Facilities	Pearl City Junction or Manana Storage bus maintenance facility	\$7.3M	
Bus Signal Preemption	Express bus routes (specific routes and/or signals to be identified through future study)	\$3.0M + \$0.9M/yr O&M	
Park-and-Ride Lots	(see TDM Element)	(see TDM Element)	(see TDM Element)
Transit Centers/ Intermodal Terminals	Aloha Stadium - Phase I	\$0.6M	
	Waipahu	\$2.3M	
	Leeward Oahu	\$2.3M	
TheBus Equipment & Special Programs	Electronic fareboxes	\$1.8M	
Bus Stop Site Improvements	Bus bays, pads, shelters, benches, ADA improvements, etc.	\$0.9M	continued implementation
New Service Types (subject to future study)	<ul style="list-style-type: none"> • Jitneys • Subscription bus services • Shared-ride taxi • Local circulators & shuttles 	assume included in bus fleet costs	subject to future study

Notes:

- a. All cost estimates in millions of 1994 dollars.
- b. Bus acquisition costs assume 12-year vehicle replacement cycle. Costs could vary depending upon extent to which future services are provided by private operators.
- c. Handi-Van acquisition costs assume 5-year replacement cycle.

TABLE A-2c
TRANSPORTATION DEMAND MANAGEMENT ELEMENT, 2001-2005 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Type of Measure	Description	Estimated Cost [a]	Comments
HOV Facilities	(see Table A-2d)	(see Table A-2d)	
HOV Facility Enforcement	Enforce HOV lane vehicle occupancy requirements & raise HOV minimum occupancy threshold to 3 persons per vehicle as necessary	\$0.75M/yr enforcement	continued implementation
Park-and-Ride Lots	Ewa	\$2.7M [d]	
	Milliani Mauka expansion	\$1.3M [d]	
	Windward Oahu (Kaneohe, Kailua)	\$2.7M	
Rideshare Programs	<ul style="list-style-type: none"> • Matching services • Preferential carpool/vanpool parking • Guaranteed ride home programs 	[b] [c] [b]	continued implementation
Work Behavior Changes	<ul style="list-style-type: none"> • Encourage telecommuting • Encourage flexible work hours • Encourage compressed work weeks 	[c] [c] [c]	continued implementation
Parking Management	<ul style="list-style-type: none"> • Mandate reduction of parking supply via code changes • Mandate elimination of employee parking subsidies • Mandate parking cash-out/travel allowance • Mandate pricing strategies • Residential permit parking program 	[c] [c] [c] [c] \$0.04M/yr O&M	mandated via trip reduction ordinance and code changes
Public Transit Support	<ul style="list-style-type: none"> • Transit pass subsidies • Public transit marketing 	[c] [b]	continued implementation
Transportation Management Associations (TMAs) for geographic areas	<ul style="list-style-type: none"> • Central Oahu • Ewa/Kapolei • Kakaako • Kahili/Iwilei/Airport • Continued operation of TMAs implemented in 1995-2000 time period 	\$2.4M/yr total (\$0.3M/yr each) [d]	4 TMAs formed in second period
Trip Reduction Ordinance	Monitor and enforce trip reduction ordinance implemented in 1995-2000 time period	\$5.0M/yr	
Bicycle Facilities	New bike routes, bike lanes & bike paths per <i>Bike Plan Hawaii Master Plan</i>	\$23.3M [d]	
	Additional bikeways proposed per <i>Kapolei Area Bikeway Plan</i>	[c]	concurrent with development
	Include new bikeways in Central Oahu development plans	[c]	concurrent with development

TABLE A-2c (continued)
TRANSPORTATION DEMAND MANAGEMENT ELEMENT, 2001-2005 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Type of Measure	Description	Estimated Cost [a]	Comments
Bicycle Facilities (continued)	Bicycle lockers & showers at employment centers & public multi-modal transit centers	[c]	continued implementation
Pedestrian Facilities/ Walkways	City of Kapolei pedestrian system	[c]	concurrent with development

Notes:

- a. All cost estimates in millions of 1994 dollars.
- b. Included in estimated TMA costs.
- c. Costs borne by employers and/or developers.
- d. All or portion of costs could be borne by employers and/or developers.

TABLE A-2d
TDM ELEMENT - HOV FACILITIES, 2001-2005 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Location	Description	Estimated Cost [a]
1.	HOV System: Central (PM peak period)	PM peak operation:	[b] included in 1995-2000 Leeward system cost \$8.0M [c] existing
2.		<ul style="list-style-type: none"> Nimitz Hwy Viaduct HOV facility* to Keehi Interchange connects to H-1 median shoulder/contraflow lane from Keehi Interchange to Waiawa Interchange: <ul style="list-style-type: none"> median shoulder lane from Keehi Interchange to Pearl City Interchange contraflow lane from Pearl City Interchange to Waiawa Interchange (removing 2 inbound lanes while in operation) 	
3.		<ul style="list-style-type: none"> continues through Waiawa Interchange as contraflow lane on H-2 inbound connector & transitions through crossover mauka of Waiawa Interchange to H-2 outbound HOV lane (requires widening of existing inbound connector & bridges) H-2 outbound HOV lane from Waiawa Interchange to Mililani Interchange 	
4.	HOV System: East Honolulu (AM peak period)	Kalaniana'ole Hwy from West Halemaumau St to Keahole St: extend existing AM contraflow HOV operation (after completion of widening project); would serve existing park-and-ride lot at Keahole St	\$1.0M
5.	HOV System: Moanalua (AM & PM peak periods)	North King St from Middle St to Liliha St: contraflow lane HOV (after baseline North King St widening)	\$5.0M + \$0.25M/yr ops

Notes:

- * Denotes baseline project.
- a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction.
- b. Nimitz Highway Viaduct project costs are included in Highway Element (see Table A-1a).
- c. Improvement could be partially funded by developers.

TABLE A-3a
HIGHWAY ELEMENT, 2006-2020 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
STATE PROJECTS				
S28.	Interstate H-1*	University Av Interchange	Improve interchange: • Construct new ramps to allow all movements • Safety improvements	\$18.0M
S29.	Interstate H-2	H-2 between Mililani Interchange & Waipio Interchange	New interchange serving area mauka of H-2 s/o Kipapa Gulch [c]	\$19.0M [b]
S30.	Interstate H-2	H-2 between Waiawa Interchange & Waipio Interchange	New interchange serving Waipio Mauka/Gentry area [c]	\$19.0M [b]
S31.	Farrington Hwy	H-1 terminus in Kapolei to Nanakuli	Widen to 6 lanes	\$27.5M [b]
S32.	Farrington Hwy Interchanges	Makaiwa Hills interchanges	Construct new interchanges	\$38.0M [b]
S12.	Kahekili Hwy	Likelike Hwy to Haiku Rd	• Enlarge baseline widening project (#S11a) to provide 6 lanes to Haiku Rd • Peak contraflow operation (i.e., 4 in-bound & 2 outbound in AM)	\$1.5M + \$0.25M/yr ops
S34.	Kalaniana'ole Hwy	Keolu Dr to Kailua Rd	Widen to 6 lanes	\$12.0M
S35.	Kalaniana'ole Hwy	Laukahi St to Kilauea Av off-ramp	Add 1 lane WB	\$20.1M
S36.	Kalaniana'ole Hwy	Waimanalo Beach Park to Saddle City	Widen to 4 lanes	\$42.0M
S37.	Kamakee St*	Ala Moana Bl to Kapiolani Bl	Acquire 20' additional R/W & widen to 4 lanes (HCDA)	\$18.0M [b]
S39.	Kamehameha Hwy	Ka Uka Bl to Lanikuhana Av	Widen to 4 lanes (include pedestrian walkway on widened bridge over Kipapa Gulch)	\$85.0M
S40.	Kunia Rd	Royal Kunia to Schofield	Widen to 4 lanes	\$40.5M [b]
S41.	Likelike Hwy	Kamehameha Hwy to Kahekili Hwy	Widen to 6 lanes	\$11.5M
S42.	Queen St & Pohukaina St*	Punchbowl St to Pensacola St	Street extensions for one-way couplet (HCDA project): • Queen St extended from Kamakee St to Pensacola St, curving mauka to intersect Waimanu St opposite Pensacola St • Pohukaina St extended to Ward Av; Auahi St Waikiki of Ward Av aligned with Pohukaina St extension; Pohukaina St/Auahi St extended & curved mauka to merge with Queen St extension makai of Pensacola St • 3 Ewa-bound lanes on Queen St; 3 Waikiki-bound lanes on Pohukaina St/Auahi St	\$4.5M [b]

TABLE A-3a (continued)
HIGHWAY ELEMENT, 2006-2020 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]
CITY PROJECTS				
C16.	Alakea St*	Queen St to King St	Add one lane	\$1.4M
C17.	Auiki St*	Sand Island Access Rd to Nimitz Hwy	Widen to 4 lanes	\$3.8M
C18.	Central East-West Rd	Extension of Ka Uka Bl to Kunia Rd	New 4-lane east-west road	\$70.1M [b]
C19.	Central Mauka Rd	Mililani Mauka (or Leilehua Interchange) to Kamehameha Hwy stub at Waiawa (or Moanalua Rd extension); parallel to & mauka of H-2	New 4-lane north-south road (with connections to H-2 interchanges) [c]	\$160.0M [b]
C20.	Kaliua Rd*	Hahani St to Wanaao Rd	Widen to 4 lanes	\$2.2M
C21.	Kamehameha Hwy*	Haleiwa	Add left-turn lanes on Kamehameha Hwy at Haleiwa Rd & Paalaa Rd	\$1.7M
C22.	Lusitana St & Punchbowl St*	Vicinity of Vineyard Bl	Lusitana/Punchbowl St one-way couplet: <ul style="list-style-type: none"> • 4 lanes mauka-bound on Alapai St to Lusitana St • 3 lanes mauka-bound on Lusitana St from Alapai St to existing H-1 WB on-ramp at Punchbowl St (at-grade intersection of Vineyard Bl & Lusitana St) • 3 lanes makai-bound on Punchbowl St makai of Lusitana St 	\$0.9M
C23.	McCully St*	Kapiolani Bl to King St	Widen to 5 lanes to provide a center left-turn lane	\$8.4M
C24.	McCully St*	Beretania St to Dole St	Widen overpass by 2 additional lanes & construct loop on-ramp from NB McCully St to existing WB H-1 on-ramp at Alexander St	\$22.5M
C25.	Mokauea St*	Nimitz Hwy to Dillingham Bl	Widen to 4 lanes	\$1.4M
C26.	Vicinity of University Av*	Kapiolani Bl to Ala Wai Bl	Construct new Ala Wai Canal bridge & connecting roadway section; 2 one-way mauka-bound lanes on each	\$4.7M

Notes:

* Denotes baseline project.

a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction. For projects currently underway, represents estimated remaining unencumbered cost to complete (i.e., does not include awarded, obligated or spent funds).

b. Improvement could be partially or fully funded by developers.

c. Need for Central Mauka Road and new H-2 interchanges may not arise if development and traffic growth in Central Oahu occurs as per current developer plans and traffic studies. Need arises if buildout of Planning Department Year 2020 socioeconomic projections for Central Oahu occurs, which represents substantially greater development than indicated in current plans.

TABLE A-3b
TRANSIT ELEMENT, 2006-2020 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Improvement	Description	Estimated Cost [a]	Comments
Increased Bus Fleet & Service Levels	Bus fleet enlarged to ~715 vehicles by 2006 & then maintained at that level (could be combination of increases in TheBus service & private operators)	\$254.2M + O&M [b]	estimated acquisition costs 2006-2020
	Additional service added outbound from Waiawa to Kapolei & Central Oahu areas	included in above	continued implementation
	Additional service added within/between Kapolei & Central Oahu areas	included in above	continued implementation
Increased Handi-Van Fleet	Handi-Van fleet increased to ~125 vehicles by 2006 & then maintained at that level	\$28.5M + O&M [c]	estimated acquisition costs 2006-2020
New or Expanded Bus System Base Facilities	Halawa bus facility improvements	\$15.0M	
	Kalihi-Palama bus facility improvements	\$15.0M	
Park-and-Ride Lots	(see TDM Element)	(see TDM Element)	
Transit Centers/ Intermodal Terminals	Aloha Stadium - Phase II	\$2.7M	
	Rapid transit stations	[d]	
TheBus Equipment & Special Programs	Electronic fareboxes	\$2.3M	
	Tow wrecker	\$2.6M	
Bus Stop Site Improvements	Bus bays, pads, shelters, benches, ADA improvements, etc.	\$1.8M	continued implementation
New Service Types (subject to future study)	<ul style="list-style-type: none"> • Jitneys • Subscription bus services • Shared-ride taxi • Local circulators & shuttles 	assume included in bus fleet costs	subject to future study
Rapid Transit in PUC Corridor*	High-capacity rapid transit system operating on exclusive right-of-way from Pearl City to UH Manoa (technology and alignment to be determined through future study)	\$1,837.8M + \$52.0M/yr O&M [e]	

Notes:

- * Denotes baseline project.
- a. All cost estimates in millions of 1994 dollars.
- b. Bus acquisition costs assume 12-year vehicle replacement cycle. Costs could vary depending upon extent to which future services are provided by private operators.
- c. Handi-Van acquisition costs assume 5-year replacement cycle.
- d. Included in rapid transit costs.
- e. O&M cost shown is estimated annual average at full operation.

TABLE A-3c
TRANSPORTATION DEMAND MANAGEMENT ELEMENT, 2006-2020 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Type of Measure	Description	Estimated Cost [a]	Comments
HOV Facilities	(see Table A-3d)	(see Table A-3d)	
HOV Facility Enforcement	Enforce HOV lane vehicle occupancy requirements & raise HOV minimum occupancy threshold to 3 persons per vehicle as necessary	\$0.75M/yr enforcement	continued implementation
Park-and-Ride Lots	Rapid transit stations	[e]	
Rideshare Programs	<ul style="list-style-type: none"> • Matching services • Preferential carpool/vanpool parking • Guaranteed ride home programs 	[b] [c] [b]	continued implementation
Work Behavior Changes	<ul style="list-style-type: none"> • Encourage telecommuting • Encourage flexible work hours • Encourage compressed work weeks 	[c] [c] [c]	continued implementation
Parking Management	<ul style="list-style-type: none"> • Mandate reduction of parking supply via code changes • Mandate elimination of employee parking subsidies • Mandate parking cash-out/travel allowance • Mandate pricing strategies • Residential permit parking program 	[c] [c] [c] [c] \$0.04M/yr O&M	continued implementation
Public Transit Support	<ul style="list-style-type: none"> • Transit pass subsidies • Public transit marketing 	[c] [b]	continued implementation
Transportation Management Associations (TMAs) for geographic areas	Continued operation of TMAs implemented in 1995-2000 and 2001-2005 time periods	\$2.4M/yr total (\$0.3M/yr each) [d]	
Trip Reduction Ordinance	Monitor and enforce trip reduction ordinance implemented in 1995-2000 time period	\$5.0M/yr	
Bicycle Facilities	New bike routes, bike lanes & bike paths per <i>Bike Plan Hawaii</i> Master Plan	\$26.1M [d]	
	Include new bikeways in Central Oahu development plans	[c]	concurrent with development
	Bicycle lockers & showers at employment centers & public multi-modal transit centers	[c]	continued implementation

Notes:

- a. All cost estimates in millions of 1994 dollars.
- b. Included in estimated TMA costs.
- c. Costs borne by employers and/or developers.
- d. All or portion of costs could be borne by employers and/or developers.
- e. Included in rapid transit costs (see Table A-3b).

TABLE A-3d
TDM ELEMENT - HOV FACILITIES, 2006-2020 TIME PERIOD
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Location	Description	Estimated Cost [a]
6a.	HOV System: East Honolulu (AM peak period)	H-1 from Ainakoa Av to Kapiolani Interchange: reversible lane HOV (to connect with Kalaniana'ole Hwy HOV)	\$40.0M + \$0.25M/yr ops
6b.		H-1 at Kapiolani Interchange: construct HOV ramp to provide direct connection from H-1 contraflow HOV lane to Kapiolani BI	included above
6c.		Kapiolani BI: Convert existing reversible lane operation on Kapiolani BI to HOV use only	\$1.0M
7.	HOV System: Leeward (AM & PM peak periods)	AM peak: construct H-1 HOV median lane from Makakilo Interchange to crossover Ewa of Waiawa Interchange (connects to initial Leeward HOV system described for 1995-2000)	\$61.0M [b,c]
		PM peak: construct H-1 HOV median lane from Waiawa Interchange to Makakilo Interchange (continues from initial Leeward HOV system described for 1995-2000)	included above
8.	HOV System: Moanalua (AM & PM peak periods)	Moanalua Fwy from Puuloa Rd to Middle St: construct HOV viaduct/ramp to provide direct connection from Moanalua Fwy HOV to North King St contraflow HOV	\$22.0M

Notes:

- a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction.
- b. Improvement could be partially funded by developers.
- c. Assumes construction of new HOV lanes in H-1 median. Cost would be less if provide HOV lanes in existing shoulder.



APPENDIX B

PUBLIC PARTICIPATION PROGRAM REPORT

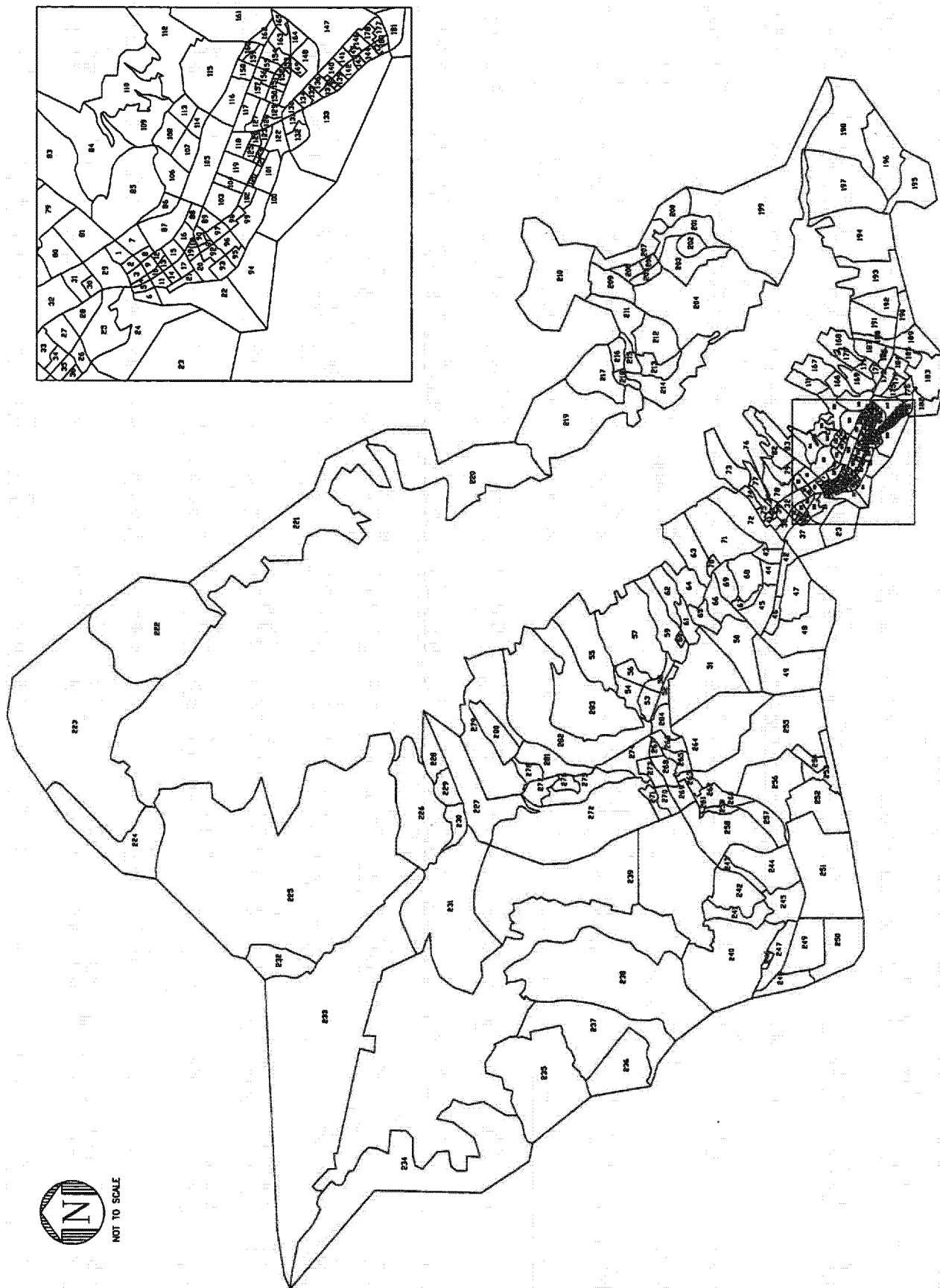
(Available Under Separate Cover)

APPENDIX C

YEAR 1990 AND YEAR 2020 SOCIOECONOMIC DATA BY ZONE

Planning Department, City and County of Honolulu

June, 1994



KAKU ASSOCIATES

FIGURE C-1
OMPO MODEL ZONE SYSTEM

TABLE C-1
SOCIOECONOMIC DATA BY TAZ - YEAR 1990 BASE SCENARIO

TAZ	MiE	GovE	HotE	AgE	TCUE	IndE	FIRE	SvcE	RetE	ConE	TotE	Pop	HU	HR	RU	GQP
1	0	27	0	15	0	17	13	301	63	0	436	0	0	0	0	0
2	0	99	0	17	59	98	31	204	290	0	798	2399	1156	0	1156	0
3	0	58	0	0	16	22	81	114	404	0	695	2099	1004	0	1004	61
4	0	0	0	0	51	149	301	384	315	0	1200	346	183	0	183	80
5	0	103	0	14	72	347	682	334	417	0		27	19	0	19	7
6	0	12	0	0	0	0	0	28	0	0	40	8	0	0	0	8
7	0	56	0	0	17	38	109	621	204	111	1156	1002	639	0	639	66
8	0	72	0	0	23	15	84	564	147	67	972	1670	908	0	908	11
9	0	518	0	28	1389	343	370	1670	1216	111	5645	15	1	0	1	8
10	0	109	0	0	134	189	1009	1202	652	38	3333	432	350	0	350	0
11	0	736	0	200	237	564	3594	4049	1022	786	11188	0	0	0	0	0
12	0	27	0	12	3776	410	73	321	196	31	4846	5	1	0	1	0
13	0	403	0	30	214	142	1865	2435	760	383	6232	0	0	0	0	0
14	0	239	0	30	906	467	4000	2735	899	274	9550	539	347	0	347	0
15	0	1838	0	0	17	31	101	1035	212	56	3290	0	0	0	0	0
16	0	1515	0	7	509	79	77	411	233	201	3032	0	0	0	0	0
17	0	1085	0	14	149	29	438	1024	138	151	3028	2	0	0	0	2
18	0	0	0	0	17	23	100	351	85	17	593	0	0	0	0	0
19	0	0	0	0	102	185	116	351	141	34	929	0	0	0	0	0
20	0	570	0	0	221	254	116	468	339	292	2260	176	23	0	23	111
21	591	1559	0	0	32	0	100	422	253	117	3074	1	2	0	2	1
22	145	293	0	0	259	43	65	349	60	13	1227	2	1	0	1	1
23	689	58	0	0	145	398	40	417	23	807	2577	408	0	0	0	408
24	0	30	0	52	773	933	9	394	407	371	2969	291	0	0	0	291
25	0	15	0	52	662	933	51	394	325	248	2680	292	66	0	66	79
26	0	15	0	17	221	933	34	394	325	186	2125	25	3	0	3	19
27	0	75	0	17	331	933	43	394	407	248	2448	72	35	0	35	2
28	0	166	0	35	221	933	34	394	163	186	2132	1077	532	0	532	179
29	0	121	19	0	71	0	105	612	370	50	1348	4208	1516	26	1516	42
30	0	15	0	0	0	0	0	0	64	0	79	1609	406	0	406	0
31	0	51	0	0	19	42	82	396	137	40	767	2144	638	0	638	50
32	0	67	0	0	163	142	109	1192	451	18	2142	6185	1928	0	1928	61
33	0	56	0	16	9	55	37	145	249	36	603	1190	447	0	447	0
34	0	38	0	12	9	28	25	145	249	18	524	2182	621	0	621	1
35	0	0	0	6	36	222	124	218	561	146	1313	31	13	0	13	0
36	0	0	0	6	36	249	62	218	187	164	922	1	1	0	1	0
37	0	135	0	174	957	3000	81	801	1255	2071	8474	3570	809	0	809	1111
38	0	52	0	21	506	1445	263	660	861	934	4742	5857	1416	0	1416	136
39	0	35	0	0	14	26	45	130	43	0	293	3575	804	0	804	67
40	0	59	0	0	0	0	29	75	135	22	320	2390	626	0	626	0
41	0	12	0	0	19	28	62	249	123	18	511	5040	1246	0	1246	41
42	0	0	395	0	0	25	0	0	0	0	420	15	5	692	0	4
43	0	290	0	222	1119	1929	334	1254	1390	3137	9675	36	1	0	1	35
44	0	0	0	0	0	0	13	0	120	18	151	3182	937	0	937	0
45	215	12	0	0	0	0	29	112	98	0	466	4796	1466	0	1466	0
46	268	1865	0	27	120	44	105	1279	953	199	4860	2618	783	0	783	0
47	0	1222	16	140	7983	3022	301	3242	2299	1888	20113	12	0	23	0	12
48	0	0	0	0	353	15	0	17	11	0	396	976	57	0	57	757
49	7262	695	0	0	0	0	0	197	161	53	8368	6742	1874	0	1874	93
50	11698	3662	0	0	385	3547	36	573	385	161	20447	7964	738	0	738	5883
51	1826	529	0	24	74	67	16	249	256	37	3078	2384	629	0	629	88
52	0	45	0	0	66	10	0	135	356	25	637	1610	521	0	521	7
53	328	121	0	0	59	0	23	72	71	0	674	5055	1735	0	1735	9
54	250	0	0	0	0	53	0	242	17	34	596	5383	1477	0	1477	0
55	0	23	0	0	0	18	9	122	46	0	218	7313	2002	0	2002	0
56	0	0	0	0	0	39	17	316	21	0	393	5904	1611	0	1611	0
57	0	593	0	42	282	290	223	2182	1176	377	5165	16470	5033	0	5033	156
58	0	0	0	0	84	25	187	286	933	0	1515	2914	874	0	874	0
59	0	85	13	25	62	218	161	637	878	419	2498	14056	5751	22	5632	0
60	0	109	0	0	137	146	425	1244	2919	15	4995	104	26	0	26	3

TABLE C-1 (Continued)
SOCIOECONOMIC DATA BY TAZ - YEAR 1990 BASE SCENARIO

TAZ	MilE	GovE	HotE	AgE	TCUE	IndE	FIRE	SvcE	RetE	ConE	TotE	Pop	HU	HR	RU	GQP
61	0	53	0	0	130	135	56	606	499	47	1526	4206	1192	0	1192	13
62	0	9	0	11	0	0	0	127	60	38	245	4689	1484	0	1484	17
63	376	26	0	0	0	0	0	20	0	47	469	1236	22	0	22	1164
64	0	8	0	35	0	0	0	119	20	100	282	4952	1511	0	1511	9
65	0	9	0	0	0	0	0	260	45	0	314	3080	835	0	835	0
66	0	9	0	0	0	25	0	134	0	0	168	6556	2145	0	2145	0
67	0	0	0	0	0	0	0	37	18	56	111	5845	1414	0	1414	14
68	0	16	0	0	33	12	21	199	143	21	445	16332	6322	0	6322	0
69	21	0	0	0	0	0	0	20	0	0	41	8835	2353	0	2353	0
70	0	9	0	0	0	0	15	184	9	0	217	2758	906	0	906	0
71	3007	245	0	0	27	12	41	1680	172	56	5240	6894	1918	0	1918	211
72	1611	1063	0	23	110	153	44	509	157	145	3815	2952	917	0	917	240
73	0	0	0	0	19	17	0	83	0	0	119	4077	1000	0	1000	47
74	0	0	0	0	29	0	20	164	12	0	225	2781	564	0	564	106
75	0	114	0	0	29	45	0	175	41	0	404	3433	828	0	828	0
76	0	36	0	0	0	0	0	72	31	0	139	1827	384	0	384	12
77	0	27	0	0	0	0	24	149	35	35	270	5680	1370	0	1370	16
78	0	186	0	0	19	44	80	695	614	67	1705	5991	1681	0	1681	157
79	0	95	0	10	0	0	96	1681	155	0	2037	4837	1613	0	1613	201
80	0	57	0	0	56	31	72	397	287	0	900	2978	971	0	971	116
81	0	169	0	0	16	138	77	2795	497	97	3789	4724	1661	0	1661	671
82	0	65	0	22	0	42	50	785	170	66	1200	3687	1250	0	1250	122
83	0	14	3	0	32	48	70	700	48	0	915	5264	2148	5	2147	85
84	0	44	0	17	0	0	23	147	0	0	231	5429	1628	0	1628	0
85	32	127	0	13	0	0	86	736	353	0	1347	5632	2410	0	2410	8
86	0	67	0	8	75	36	0	381	42	22	631	1536	836	0	836	0
87	0	1275	0	31	75	142	398	4192	672	101	6886	2878	1277	0	1277	407
88	0	0	0	0	1352	178	398	3049	126	101	5204	328	124	0	124	133
89	0	0	0	17	273	684	183	664	368	58	2247	197	112	0	112	0
90	0	50	0	9	137	0	61	442	184	0	883	426	295	0	295	1
91	0	250	0	0	137	228	122	442	184	0	1363	8	4	0	4	0
92	0	300	0	17	273	684	61	442	368	233	2378	13	3	0	3	5
93	0	0	0	26	410	684	183	442	368	174	2287	0	0	0	0	0
94	56	400	0	43	410	684	122	664	368	233	2980	15	1	0	1	7
95	0	0	0	17	273	456	183	442	368	174	1913	0	0	0	0	0
96	0	0	0	26	410	456	122	442	736	58	2250	15	5	0	5	0
97	0	0	0	17	410	684	183	442	736	233	2705	47	17	0	17	14
98	0	0	0	3	261	694	179	557	783	52	2529	21	12	0	12	0
99	0	0	0	14	653	832	179	742	2089	412	4921	479	352	0	352	0
100	0	43	0	3	0	0	0	0	261	0	307	81	0	0	0	81
101	0	247	0	24	22	171	338	1394	8053	97	10346	0	0	0	0	0
102	0	0	0	3	261	555	179	557	522	52	2129	0	0	0	0	0
103	0	384	0	0	0	0	0	0	0	0	384	6	1	0	1	0
104	0	7	0	0	55	0	15	169	129	7	382	846	452	0	452	0
105	0	2063	30	30	240	494	1338	3435	2979	375	10984	4688	2471	41	2471	12
106	0	0	0	0	14	29	24	182	40	0	289	5177	2842	0	2842	0
107	0	20	0	0	179	0	53	85	45	0	382	5924	2954	0	2954	0
108	0	57	0	0	0	10	113	421	28	0	629	4757	2376	0	2376	247
109	0	0	0	0	0	11	8	339	25	0	383	876	317	0	317	0
110	0	0	0	29	0	0	11	50	0	53	143	853	357	0	357	0
111	0	65	0	0	16	17	32	140	32	21	323	3537	1124	0	1124	15
112	0	35	0	0	0	0	36	272	49	62	454	4236	1588	0	1588	53
113	0	0	0	0	27	27	56	225	23	0	358	3080	1849	0	1849	9
114	0	26	0	0	0	0	0	225	38	15	304	1136	669	0	669	41
115	0	86	5	14	71	43	111	1630	215	188	2363	4998	2133	7	2132	183
116	0	23	0	13	37	62	110	1229	480	57	2011	3246	1368	0	1368	442
117	0	21	0	0	39	45	87	222	227	4	645	1432	708	0	708	0
118	0	164	141	16	266	329	213	688	711	77	2605	2695	1790	215	1645	0
119	0	66	0	8	219	853	284	958	1158	142	3688	1523	798	0	798	31
120	0	0	0	3	0	139	179	371	261	361	1314	0	0	0	0	0

TABLE C-1 (Continued)
SOCIOECONOMIC DATA BY TAZ - YEAR 1990 BASE SCENARIO

TAZ	MilE	GovE	HotE	AgrE	TCUE	IndE	FIRE	SvcE	RetE	ConE	TotE	Pop	HU	HR	RU	GQP
121	0	0	0	3	65	277	357	742	522	52	2018	0	0	0	0	0
122	0	0	832	3	65	277	119	742	783	103	2924	1738	1257	1171	1257	19
123	0	61	0	3	266	329	426	688	569	115	2457	804	485	0	485	2
124	0	41	0	0	266	165	426	551	427	58	1934	0	0	0	0	0
125	0	61	0	5	266	219	284	551	569	77	2032	1637	1029	0	1029	0
126	0	82	0	3	266	55	71	275	569	58	1379	99	42	0	42	0
127	0	21	0	0	33	23	73	222	97	4	473	1465	768	0	768	0
128	0	2	0	0	33	23	73	222	130	4	487	514	329	0	329	0
129	0	2	0	0	26	23	58	222	195	1	527	818	431	0	431	0
130	0	21	58	0	20	5	22	71	148	31	376	597	399	109	245	0
131	0	37	234	25	291	44	233	110	512	290	1776	2473	1798	340	1551	0
132	0	9	351	31	436	44	233	110	512	97	1823	3527	2637	809	1842	0
133	0	484	8416	12	1008	202	423	2553	1214	321	14633	1190	2087	11770	473	62
134	0	21	58	0	27	5	22	54	148	9	344	1184	756	72	568	0
135	0	21	58	0	27	3	33	54	198	35	429	541	347	676	142	0
136	0	21	58	0	20	10	55	71	99	9	343	1429	1011	173	845	0
137	0	21	58	0	40	10	88	107	395	4	723	72	63	96	34	0
138	0	65	0	3	308	68	174	301	772	31	1722	173	76	714	57	86
139	0	164	0	5	514	68	243	301	965	31	2291	129	131	79	92	1
140	0	16	0	5	308	51	69	150	386	31	1016	1497	1174	859	704	0
141	0	16	0	5	514	51	69	100	579	31	1365	1232	864	978	530	0
142	0	65	3083	8	411	102	139	150	1158	31	5147	6	2	2697	2	2
143	0	29	1042	0	21	13	29	74	149	3	1360	183	156	1690	58	31
144	0	51	1042	0	42	23	43	130	149	5	1485	378	525	1471	228	0
145	0	0	74	0	0	6	50	44	34	11	219	776	687	78	607	0
146	0	0	147	0	0	4	59	58	79	22	369	2113	1526	623	1444	0
147	0	12	0	27	75	312	29	628	1123	1065	3271	3691	1733	0	1733	1
148	0	110	0	13	6	13	87	421	85	51	786	4023	2141	0	2141	1
149	0	0	0	0	4	0	5	47	4	0	60	1256	735	0	735	0
150	0	0	0	0	9	6	5	14	0	0	34	1182	590	0	590	0
151	0	0	0	0	9	6	5	0	0	0	20	846	415	0	415	0
152	0	0	0	0	8	5	7	14	0	0	34	988	415	0	415	0
153	0	4	0	0	0	0	0	0	0	0	4	475	224	0	224	0
154	0	0	0	4	0	32	45	126	114	12	333	2094	1046	0	1046	0
155	0	0	0	8	21	40	33	130	146	36	414	810	440	0	440	1
156	0	0	0	11	5	0	4	16	55	22	113	891	447	0	447	1
157	0	12	0	8	26	40	37	179	164	86	552	1584	803	0	803	0
158	0	23	0	7	21	52	47	461	320	47	978	767	316	0	316	97
159	0	17	0	5	21	21	47	461	320	47	939	194	70	0	70	1
160	0	35	0	3	5	10	47	461	80	9	650	138	43	0	43	4
161	20	607	0	0	14	121	143	8938	752	37	10632	4340	642	0	642	2636
162	0	17	0	5	21	62	63	461	400	28	1057	612	393	0	393	0
163	0	8	0	3	0	24	60	126	114	10	345	2120	1017	0	1017	0
164	0	0	0	0	4	0	5	0	0	17	26	2013	862	0	862	0
165	0	10	0	4	0	24	45	108	57	12	260	998	485	0	485	0
166	0	115	0	10	0	26	53	394	399	0	997	1383	454	0	454	62
167	0	0	0	12	17	13	0	110	25	41	218	3851	1268	0	1268	0
168	0	0	0	15	0	15	16	100	45	0	191	3194	1026	0	1026	77
169	0	0	0	0	23	0	0	110	0	19	152	4075	1470	0	1470	170
170	0	109	0	0	0	15	15	154	71	0	364	4072	1152	0	1152	0
171	0	0	0	0	0	0	0	25	68	0	93	3081	1035	0	1035	9
172	0	13	0	31	14	52	19	1072	522	89	1812	3118	1156	0	1156	10
173	0	75	0	14	195	127	373	918	852	34	2588	4488	1618	0	1618	55
174	0	19	0	0	14	0	31	105	52	0	221	2595	884	0	884	5
175	0	51	0	0	0	8	65	169	339	0	632	3664	1273	0	1273	0
176	0	12	1	27	136	30	69	246	298	41	860	3911	1429	1	1428	0
177	0	89	74	0	0	6	0	15	23	11	218	144	113	24	87	0
178	0	0	196	0	0	4	59	175	90	11	535	1378	2305	1	1249	0
179	0	36	1042	0	35	13	36	93	124	1	1380	85	97	2414	37	0
180	0	29	1042	0	42	16	36	74	75	3	1317	661	444	792	352	0

TABLE C-1 (Continued)
SOCIOECONOMIC DATA BY TAZ - YEAR 1990 BASE SCENARIO

TAZ	MiE	GovE	HotE	AgrE	TCUE	IndE	FIRE	SvcE	RetE	ConE	TotE	Pop	HU	HR	RU	GQP
181	0	185	0	0	0	2	0	138	0	0	325	37	11	0	11	20
182	0	62	99	0	90	11	64	1240	553	57	2176	2499	1692	152	1522	16
183	1543	381	0	14	27	29	44	397	129	0	2564	1311	554	0	554	1
184	0	188	0	0	0	88	44	977	54	26	1377	3856	1272	0	1272	207
185	0	70	0	13	16	27	16	286	229	0	657	2993	990	0	990	41
186	0	30	0	14	12	108	40	257	353	0	814	2760	1018	0	1018	0
187	0	13	0	0	0	0	44	220	23	40	340	3779	1376	0	1376	110
188	0	53	0	0	0	0	137	352	89	0	631	2334	941	0	941	0
189	0	114	0	0	171	80	722	1348	1671	79	4185	3024	1284	0	1284	0
190	0	51	262	0	51	29	15	621	134	15	1178	720	415	369	415	0
191	0	0	0	9	0	34	0	224	29	15	311	2771	980	0	980	0
192	32	0	0	19	23	33	28	72	20	51	278	3372	1149	0	1149	0
193	0	14	0	19	52	35	33	503	140	70	866	5617	1953	0	1953	0
194	0	34	0	15	0	44	40	291	163	92	679	5742	1913	0	1913	31
195	0	24	0	0	0	0	77	115	109	45	370	1674	628	0	628	0
196	0	98	0	0	43	0	364	524	592	122	1743	5251	1670	0	1670	253
197	0	36	0	14	84	38	143	287	97	78	777	12131	4445	0	4445	0
198	0	0	0	0	0	0	0	142	38	0	180	8376	2491	0	2491	1
199	108	94	0	319	17	75	15	631	229	50	1538	9055	2204	0	2204	76
200	0	7	0	0	13	15	17	215	46	60	373	1536	682	0	682	0
201	0	222	1	0	139	106	458	1174	1004	41	3145	6980	2131	1	2130	11
202	0	35	0	0	58	49	62	307	206	0	717	3699	1119	0	1119	0
203	0	0	0	1	0	11	21	100	32	0	165	7648	2669	0	2669	52
204	0	15	0	0	0	0	45	716	37	19	832	3910	1118	0	1118	303
205	0	0	0	30	12	55	13	431	338	129	1008	4253	1359	0	1359	0
206	0	85	0	56	48	65	62	847	721	120	2004	2568	873	0	873	0
207	0	12	1	13	103	101	0	399	101	158	888	4687	1647	1	1646	4
208	0	14	1	0	20	13	0	478	0	95	621	3391	1055	1	1054	0
209	0	65	0	0	35	12	54	195	170	94	625	3208	1026	0	1026	0
210	7879	456	0	0	80	0	64	419	356	72	9326	11662	2030	0	2030	3942
211	0	58	0	11	38	38	56	255	256	59	771	3551	1242	0	1225	8
212	0	93	0	39	7	0	72	421	64	59	755	4336	1267	0	1267	279
213	0	139	0	116	51	171	96	893	867	314	2647	5480	1605	0	1605	117
214	0	0	0	0	0	0	0	72	0	0	72	3745	1087	0	1087	5
215	0	30	0	58	32	28	13	392	282	62	897	3200	962	0	962	0
216	0	166	0	33	30	45	115	843	296	28	1556	5373	1496	0	1496	191
217	70	91	0	41	66	228	64	411	738	65	1774	11416	3716	0	3716	28
218	0	35	0	22	126	10	143	666	371	29	1402	2111	586	0	586	201
219	322	93	32	33	104	61	40	271	292	89	1337	11225	3510	45	3501	40
220	0	14	0	19	27	0	0	0	109	73	242	4660	1390	0	1390	22
221	0	111	0	17	68	28	89	414	407	44	1178	4608	1826	0	1791	0
222	0	106	35	83	32	12	81	2761	255	153	3518	6926	1517	47	1509	1075
223	0	139	346	93	181	28	60	266	384	59	1556	2798	1108	486	1058	0
224	0	46	3	77	29	28	20	229	84	37	553	4111	1488	4	1487	77
225	322	145	0	55	80	51	42	351	253	109	1408	1801	559	0	559	274
226	1020	27	0	10	0	163	0	23	68	21	1332	4303	1053	0	1053	218
227	2426	0	0	0	0	0	0	0	14	0	2440	2600	704	0	704	228
228	0	245	0	79	0	0	139	1179	772	126	2540	7930	2514	0	2514	5
229	0	875	0	75	445	319	175	2000	1450	276	5615	4214	1431	0	1431	10
230	0	302	0	0	80	79	113	835	572	147	2128	5242	1820	0	1820	31
231	17183	546	1	35	16	13	33	583	847	60	19317	19597	3556	0	3546	6086
232	0	159	0	163	64	36	115	521	493	128	1679	3956	1187	0	1187	17
233	14	16	1	233	12	402	0	215	69	126	1088	5792	2024	1	2023	23
234	0	0	134	14	27	12	0	137	128	138	590	8208	3271	190	2993	105
235	195	303	0	139	185	125	276	1580	967	138	3908	11676	3303	1	3284	95
236	0	0	0	0	40	24	0	169	0	0	233	6820	1705	0	1677	170
237	591	157	0	77	181	35	46	459	130	29	1705	4733	1135	0	1135	0
238	349	311	0	49	51	112	0	518	141	271	1802	5974	1266	0	1266	64
239	54	52	0	199	14	39	8	100	31	0	497	672	192	0	192	0
240	0	5	0	8	5	59	0	2	0	56	135	176	35	0	35	38

TABLE C-1 (Continued)
SOCIOECONOMIC DATA BY TAZ - YEAR 1990 BASE SCENARIO

TAZ	MilE	GovE	HotE	AgrE	TCUE	IndE	FIRE	SvcE	RetE	ConE	TotE	Pop	HU	HR	RU	GQP
241	0	14	0	16	7	0	24	15	54	50	180	5277	1457	0	1457	0
242	0	0	0	8	12	3	4	3	0	6	36	4399	1532	0	1532	0
243	0	0	0	0	0	11	0	0	0	0	11	152	61	0	61	0
244	0	0	0	29	4	16	1	18	0	102	170	0	0	0	0	0
245	0	27	0	15	0	0	0	0	0	7	49	0	0	0	0	0
246	0	0	0	0	0	0	0	0	0	0	0	893	202	0	202	0
247	0	0	0	0	0	0	0	0	0	0	0	417	92	0	92	0
248	0	27	1	58	0	108	0	73	225	102	594	0	0	0	0	0
249	0	0	0	15	0	54	0	0	0	7	76	0	0	0	0	0
250	0	401	0	58	60	270	12	201	113	7	1122	27	0	0	0	27
251	4146	556	0	44	22	39	35	324	551	48	5765	4529	1330	0	1330	970
252	0	4	0	30	0	54	0	37	0	0	125	5218	1443	0	1443	20
253	0	37	0	12	119	486	150	672	328	44	1848	2398	575	10	571	0
254	0	89	0	0	0	0	0	311	13	24	437	6699	1408	0	1408	0
255	193	38	0	0	0	0	0	311	53	10	605	5786	1521	0	1521	110
256	0	0	0	18	0	0	0	37	0	176	231	2061	772	0	772	0
257	0	27	0	58	8	54	0	18	113	34	312	3780	939	0	939	0
258	0	0	0	0	0	0	0	0	0	7	7	3	1	0	1	0
259	0	27	0	29	4	27	1	37	113	0	238	270	90	0	90	0
260	0	27	0	15	0	0	1	18	0	75	136	2	1	0	1	0
261	0	0	0	15	0	0	0	0	0	0	15	0	0	0	0	0
262	0	14	0	31	40	56	2	74	71	164	452	826	253	0	253	0
263	0	77	0	93	160	315	44	667	641	246	2243	3645	1135	0	1135	1
264	54	23	0	0	0	0	0	83	0	0	160	0	0	0	0	0
265	0	87	0	38	0	80	155	683	769	172	1984	4161	987	0	987	41
266	0	110	0	4	69	36	0	234	83	15	551	7038	1530	0	1530	50
267	0	24	0	0	0	0	0	18	0	0	42	2193	465	0	465	14
268	0	0	0	164	119	576	0	0	40	75	974	6172	1429	0	1429	59
269	0	176	0	35	19	48	141	705	878	31	2033	8084	2162	0	2162	5
270	0	12	0	3	0	0	0	30	0	0	45	4107	1133	0	1133	0
271	0	0	0	1	0	0	0	5	0	0	6	3300	1043	0	1043	0
272	0	0	0	7	0	0	0	15	5	0	27	154	49	0	49	0
273	0	0	0	109	0	0	0	0	0	19	128	26	7	0	7	0
274	161	0	0	3	0	0	0	0	0	12	176	39	13	0	13	0
275	97	57	0	0	6	1	0	92	112	185	550	6688	1933	0	1933	0
276	0	77	0	0	8	1	25	46	0	46	203	3779	1166	0	1166	0
277	0	19	0	0	3	1	8	0	28	0	59	4025	1311	0	1311	0
278	48	153	0	0	17	4	67	367	197	23	876	4560	1320	0	1320	0
279	338	0	0	0	0	1	8	46	28	23	444	5183	1799	0	1799	0
280	0	0	0	0	0	1	0	0	0	23	24	0	0	0	0	0
281	483	77	0	0	23	5	59	367	197	162	1373	10444	3215	0	3215	0
282	215	24	0	30	38	26	87	97	181	100	798	11828	4091	0	4091	8
283	161	0	0	18	0	0	0	27	0	0	206	0	0	0	0	0
284	0	72	0	9	7	1	5	35	20	6	155	560	224	0	224	0

List of Abbreviations:

TAZ	- Traffic Analysis Zone	Pop	- Population
MilE	- Military Employment	HU	- Housing Units
GovE	- Government Employment	HR	- Hotel Rooms
HotE	- Hotel Employment	RU	- Resident Units (Housing Units less Resort Condos)
AgrE	- Agriculture Employment	GQP	- Group Quarter Population
TCUE	- Transportation, Communication and Utilities Employment	1RU	- 1-Person Residential Units
IndE	- Industrial Employment	2RU	- 2-Person Residential Units
FIRE	- Finance, Insurance and Real Estate Employment	3RU	- 3-Person Residential Units
SvcE	- Service Employment	4RU	- 4-Person Residential Units
RetE	- Retail Employment	5RU	- 5-Person Residential Units
ConE	- Construction Employment		

TABLE C-2
SOCIOECONOMIC PROJECTIONS BY TAZ - YEAR 2020 BASE SCENARIO

TAZ	MIE	GovE	HotE	Agre	TCUE	IndE	FIRE	SvcE	RetE	ConE	Pop	HU	HR	1RU	2RU	3RU	4RU	5RU
1	0	28	0	19	0	17	13	384	89	38	451	353	0	270	70	13	1	0
2	0	103	0	21	80	98	31	429	361	70	3141	1577	0	652	542	228	103	51
3	0	61	0	0	21	22	81	245	445	39	2446	1225	0	523	422	172	74	34
4	0	0	0	0	68	149	301	585	378	46	509	334	0	253	67	13	1	0
5	0	108	0	18	98	347	682	495	468	57	342	402	0	402	0	0	0	0
6	0	12	0	0	0	0	0	28	0	18	349	267	0	204	53	10	1	0
7	0	58	0	0	23	38	109	704	230	36	1410	956	0	646	239	62	7	1
8	0	75	0	0	31	15	84	564	147	1	1596	899	0	447	286	118	35	12
9	0	567	0	34	1877	343	1243	2566	1522	339	13	0	0	0	0	0	0	0
10	0	114	42	0	182	189	1009	1325	691	57	358	347	309	229	51	9	0	0
11	0	770	14	248	320	564	3947	4733	1206	197	128	119	103	76	20	4	0	0
12	0	28	0	15	5103	410	295	785	369	284	5	1	0	0	0	0	0	1
13	0	421	0	37	289	142	2312	3289	896	199	0	0	0	0	0	0	0	0
14	0	250	0	37	1225	467	4000	2735	899	44	515	343	0	213	95	29	5	1
15	0	1922	0	0	23	31	101	1035	212	12	0	0	0	0	0	0	0	0
16	0	1584	0	8	688	79	77	411	233	32	0	0	0	0	0	0	0	0
17	0	1135	0	18	201	29	438	1024	138	14	2	0	0	0	0	0	0	0
18	0	0	0	0	23	53	100	677	292	74	0	0	0	0	0	0	0	0
19	0	0	0	0	138	290	116	677	348	87	0	0	0	0	0	0	0	0
20	0	596	0	0	298	359	116	1120	648	177	1237	413	0	105	125	71	56	54
21	429	1631	0	0	43	0	100	422	253	0	1	2	0	0	0	0	0	0
22	105	499	23	0	350	43	1056	4320	1900	931	1	32	168	0	0	0	0	0
23	500	61	0	0	195	421	40	417	23	0	408	0	0	0	0	0	0	0
24	0	32	0	64	1044	934	9	677	496	158	2261	1115	0	553	355	147	44	15
25	0	16	0	64	895	944	51	397	326	66	1809	565	0	113	153	104	90	105
26	0	16	0	21	298	936	34	394	325	11	25	3	0	1	1	0	0	0
27	0	79	0	21	447	935	43	590	468	96	1404	740	0	328	256	100	40	17
28	0	174	0	43	298	940	34	507	198	34	1074	550	0	306	167	61	14	3
29	0	126	22	0	96	0	105	895	459	53	4010	1501	27	400	465	253	196	181
30	0	16	0	0	0	0	0	0	64	0	1540	402	0	40	76	73	79	134
31	0	53	0	0	25	42	82	403	139	7	2287	708	0	131	184	132	117	144
32	0	70	0	0	221	142	109	2167	757	221	8047	2624	0	531	714	483	416	479
33	0	59	0	20	12	55	37	145	249	1	1143	445	0	126	143	73	55	48
34	0	39	0	15	12	28	25	145	249	1	2085	615	0	93	145	116	109	151
35	0	0	0	7	48	222	124	284	582	13	30	13	0	4	4	2	1	1
36	0	0	0	7	48	249	62	218	187	2	1	1	0	1	0	0	0	0
37	0	141	0	215	1293	3062	81	801	1255	58	3478	807	0	177	228	146	122	133
38	0	55	0	26	684	1452	263	1524	1132	310	13526	3507	0	353	669	642	685	1159
39	0	36	0	0	20	26	45	361	115	77	5784	1365	0	89	204	233	276	563
40	0	62	0	0	0	0	29	75	135	1	2328	632	0	73	130	117	121	191
41	0	12	0	0	25	28	62	396	169	52	6310	1625	0	157	303	296	320	550
42	0	0	539	0	0	42	0	0	0	58	15	201	1064	0	0	0	0	0
43	0	304	0	275	1512	1939	334	1254	1390	61	36	1	0	1	0	0	0	0
44	0	0	0	0	0	0	13	0	120	0	3041	928	0	155	230	174	160	208
45	156	12	0	0	0	0	29	112	98	0	4581	1451	0	269	378	271	240	294
46	195	1951	0	33	162	44	105	1279	953	8	2500	775	0	136	197	145	131	166
47	0	1278	20	174	10790	3022	301	3242	2299	376	12	5	24	0	0	0	0	0
48	0	0	0	0	477	15	0	17	11	16	971	56	0	6	11	10	11	18
49	5271	727	0	0	0	0	0	197	161	0	6444	1855	0	274	432	350	333	466
50	8492	3831	0	0	520	3587	36	573	385	0	7873	731	0	187	222	126	100	96
51	1325	554	0	30	100	67	16	249	256	0	2282	623	0	84	139	117	115	169
52	0	47	0	0	90	19	0	216	381	64	3538	1216	0	273	348	219	182	194
53	238	126	0	0	80	0	23	3833	2452	802	5435	1938	0	470	575	341	276	276
54	181	0	0	0	0	103	0	242	17	2	5358	1524	0	207	341	286	280	410
55	0	24	0	0	0	18	9	122	46	8	7397	2100	0	283	467	394	387	568
56	0	0	0	0	0	39	17	316	21	1	5690	1609	0	214	356	302	298	440
57	0	620	0	52	381	290	223	2182	1176	37	16639	5273	0	1000	1391	981	863	1039
58	0	0	0	0	113	25	187	286	933	6	2885	897	0	158	228	168	151	191
59	0	89	33	31	84	227	161	670	888	23	13817	5812	103	1795	1941	882	631	491
60	0	114	0	0	186	146	425	1244	2919	7	100	26	0	3	5	5	5	8

TABLE C-2 (Continued)
SOCIOECONOMIC PROJECTIONS BY TAZ - YEAR 2020 BASE SCENARIO

TAZ	MiE	GovE	HotE	AgE	TCUE	IndE	FIRE	SvcE	RetE	ConE	Pop	HU	HR	1RU	2RU	3RU	4RU	5RU
61	0	56	0	0	176	135	56	871	582	59	4395	1293	0	197	306	244	230	317
62	0	10	0	14	0	0	0	127	60	20	5380	1771	0	363	485	325	279	319
63	273	27	0	0	0	251	0	20	0	20	1241	25	0	5	7	5	4	5
64	0	8	0	44	0	85	0	119	20	36	5867	1863	0	348	488	347	307	373
65	0	10	0	0	0	0	0	284	52	8	3163	890	0	117	195	167	165	246
66	0	10	0	0	0	25	0	134	0	3	6372	2161	0	470	609	392	330	360
67	0	0	0	0	0	0	0	37	18	2	5722	1435	0	121	248	256	286	524
68	0	17	0	0	45	12	21	199	143	208	23204	9409	0	2837	3116	1487	1086	883
69	16	0	0	0	0	0	0	20	0	0	8439	2329	0	286	494	434	439	676
70	0	10	0	0	0	0	15	184	9	9	3013	1031	0	229	293	186	156	167
71	2183	256	0	0	37	12	41	1680	172	0	6850	1975	0	308	473	372	348	474
72	1169	1112	0	29	148	153	44	509	157	0	2831	908	0	212	264	162	133	137
73	0	0	0	0	25	17	0	145	19	28	4871	1247	0	119	231	226	246	425
74	0	0	0	0	39	0	20	164	12	2	2705	568	0	22	61	84	113	288
75	0	119	0	0	39	45	0	233	59	13	3360	840	0	69	143	150	168	310
76	0	38	0	0	0	0	0	72	31	2	1852	408	0	17	46	62	81	201
77	0	28	0	0	0	0	24	149	35	5	5721	1432	0	120	247	256	286	524
78	0	194	0	0	25	44	80	726	624	12	5983	1741	0	275	420	328	306	412
79	0	100	0	12	0	0	96	1681	155	5	4782	1653	0	409	495	289	232	228
80	0	59	0	0	76	31	72	413	292	12	3102	1052	0	248	308	187	153	157
81	0	177	0	0	21	138	77	2800	499	12	4860	1784	0	578	610	271	186	138
82	0	68	0	27	0	42	50	785	170	9	3845	1356	0	341	410	236	187	182
83	0	15	4	0	43	48	70	700	48	21	5690	2420	6	801	828	370	244	176
84	0	46	0	21	0	0	23	147	0	29	6552	2045	0	364	523	383	344	431
85	23	132	0	16	0	0	86	742	355	10	5694	2530	0	876	874	383	236	160
86	0	70	0	10	101	36	0	381	42	5	1497	845	0	418	270	112	34	11
87	0	1333	0	38	101	142	398	4202	675	17	2860	1315	0	605	427	190	66	27
88	0	0	0	0	1827	178	398	3049	126	62	320	123	0	75	35	11	2	0
89	0	0	0	21	369	744	183	1083	575	156	1378	943	0	606	252	73	11	1
90	0	52	0	11	185	60	61	2152	811	333	684	528	0	396	108	22	1	0
91	0	261	0	0	185	228	122	1297	617	207	653	504	0	378	104	21	1	0
92	0	314	0	21	369	744	61	2860	1292	537	1610	1241	0	933	254	50	3	0
93	0	0	0	32	554	879	183	2152	1175	388	341	264	0	199	54	10	1	0
94	41	418	0	53	554	969	122	4138	1624	684	281	207	0	151	45	10	1	0
95	0	0	0	21	369	651	183	2494	1267	434	266	206	0	155	42	8	1	0
96	0	0	0	32	554	651	122	2357	1503	422	599	458	0	340	97	20	1	0
97	0	0	0	21	554	879	183	2101	1527	403	1047	652	0	376	193	67	14	3
98	0	0	0	4	353	934	179	1712	1401	310	796	583	0	409	138	33	3	0
99	0	0	0	17	883	1327	179	8360	5216	1643	2981	2736	0	2505	214	17	0	0
100	0	45	0	4	0	0	0	0	261	0	81	0	0	0	0	0	0	0
101	0	259	0	30	29	171	338	1394	8053	3	0	0	0	0	0	0	0	0
102	0	0	0	4	353	795	179	2205	1295	393	595	559	0	525	32	2	0	0
103	0	402	0	0	0	0	0	0	0	36	563	524	0	487	35	2	0	0
104	0	8	0	0	74	75	15	1108	514	274	3188	1826	0	922	578	236	68	22
105	0	2158	35	37	324	494	1338	4192	3217	571	15595	8817	43	4366	2807	1166	352	117
106	0	0	0	0	20	29	24	182	40	15	5302	3029	0	1524	960	393	115	37
107	0	21	0	0	242	0	53	85	45	15	5842	3021	0	1300	1042	420	177	81
108	0	59	0	0	0	10	113	421	28	6	4701	2434	0	1151	786	341	113	43
109	0	0	0	0	0	11	8	339	25	3	932	357	0	98	113	60	46	41
110	0	0	0	36	0	0	11	50	0	2	849	371	0	125	127	57	36	25
111	0	68	0	0	21	17	32	140	32	11	3831	1264	0	261	347	232	199	226
112	0	36	0	0	0	0	36	272	49	7	4285	1668	0	481	539	271	203	173
113	0	0	0	0	37	27	56	225	23	10	3141	1959	0	1116	584	206	44	9
114	0	27	0	0	0	0	0	225	38	0	1089	663	0	384	196	67	14	3
115	0	90	7	18	96	43	111	1630	215	10	4945	2191	8	796	756	331	187	118
116	0	24	0	16	51	62	110	1383	528	67	4231	1937	0	821	667	274	118	56
117	0	22	0	0	53	45	87	257	238	9	1410	723	0	307	249	102	44	21
118	0	171	191	20	359	329	213	795	744	61	3025	2037	336	1124	565	192	39	7
119	0	69	0	10	295	853	2571	2481	2748	772	3054	1733	0	876	549	223	65	20
120	0	0	0	4	0	139	179	641	346	52	97	91	0	85	5	0	0	0

TABLE C-2 (Continued)
SOCIOECONOMIC PROJECTIONS BY TAZ - YEAR 2020 BASE SCENARIO

TAZ	MIE	GovE	HotE	AgrE	TCUE	IndE	FIRE	SvcE	RetE	ConE	Pop	HU	HR	1RU	2RU	3RU	4RU	5RU
121	0	0	0	4	88	277	357	742	522	3	0	0	0	0	0	0	0	0
122	0	0	997	4	88	277	119	1981	1172	254	1415	1247	1223	707	243	59	6	0
123	0	64	0	3	359	329	426	775	596	27	768	480	0	274	143	50	11	2
124	0	43	0	0	359	165	426	551	427	12	0	0	0	0	0	0	0	0
125	0	64	0	7	359	219	284	551	569	13	1565	1019	0	612	291	95	17	3
126	0	86	0	3	359	55	71	383	603	46	610	277	0	99	95	42	24	16
127	0	22	0	0	44	23	73	222	97	5	1480	805	0	378	260	114	38	15
128	0	2	0	0	44	23	73	222	130	2	493	327	0	201	91	29	5	1
129	0	2	0	0	36	23	58	222	195	3	823	450	0	214	145	63	21	8
130	0	22	95	0	27	5	22	456	269	88	1038	583	221	173	165	72	41	26
131	0	39	317	31	393	44	233	110	512	34	2440	1782	542	964	454	146	26	4
132	0	10	577	38	590	44	233	397	602	288	7471	5120	1415	2491	1387	514	123	30
133	0	506	10409	15	1362	202	423	2553	1214	577	784	2785	14760	0	0	0	0	0
134	0	22	94	0	36	5	22	54	148	10	1250	750	203	261	216	91	41	20
135	0	22	182	0	36	3	33	54	198	38	918	444	919	40	63	51	48	67
136	0	22	105	0	27	10	55	71	99	13	1429	1002	300	492	266	96	22	5
137	0	22	75	0	55	10	88	107	395	6	76	63	130	15	13	6	3	1
138	0	68	103	3	417	68	174	301	772	43	106	144	766	0	0	0	0	0
139	0	171	17	7	695	68	243	301	965	29	132	130	116	72	22	5	0	0
140	0	17	187	7	417	51	69	150	386	67	1758	1284	1279	395	315	126	53	24
141	0	17	185	7	695	51	69	100	579	68	1276	858	1348	205	198	89	52	34
142	0	68	3463	10	556	102	139	150	1158	111	3	531	2817	0	0	0	0	0
143	0	30	1294	0	28	13	29	74	149	62	91	352	1868	0	0	0	0	0
144	0	53	1291	0	57	23	43	130	149	62	327	523	1847	80	57	25	9	4
145	0	0	96	0	0	6	50	44	34	5	761	681	138	502	104	16	1	0
146	0	0	247	0	0	4	59	58	79	62	2595	2091	736	1417	432	95	8	0
147	0	12	0	33	102	312	29	661	1134	15	3673	1790	0	711	612	268	128	69
148	0	115	0	16	8	13	87	421	85	3	3901	2152	0	1032	692	297	96	35
149	0	0	0	0	6	0	5	47	4	0	1201	728	0	397	223	83	20	5
150	0	0	0	0	12	6	5	14	0	6	1294	673	0	292	232	93	39	17
151	0	0	0	0	12	6	5	0	0	3	875	446	0	189	154	63	27	13
152	0	0	0	0	11	5	7	14	0	5	1087	476	0	161	163	73	46	32
153	0	5	0	0	0	0	0	0	0	3	533	262	0	106	90	39	18	10
154	0	0	0	5	0	32	45	126	114	2	2054	1064	0	459	367	148	62	28
155	0	0	0	10	28	40	33	312	203	68	1719	983	0	495	311	127	37	12
156	0	0	0	14	7	0	4	16	55	1	850	442	0	192	153	61	25	11
157	0	12	0	10	35	40	37	179	164	4	1573	827	0	363	285	112	46	20
158	0	24	0	8	29	52	47	486	328	6	745	317	0	126	108	47	23	12
159	0	18	0	6	29	21	47	736	406	94	1988	775	0	220	248	127	96	83
160	0	36	0	4	7	10	47	461	80	1	156	51	0	11	14	9	8	9
161	15	635	0	0	20	121	143	8938	752	9	4476	721	0	206	232	118	89	77
162	0	18	0	6	29	62	63	467	402	2	585	389	0	241	108	34	6	1
163	0	8	0	3	0	24	60	201	138	24	2367	1183	0	486	406	172	78	40
164	0	0	0	0	6	0	5	0	0	11	2271	1013	0	352	350	153	94	64
165	0	10	0	5	0	24	45	230	95	42	1576	807	0	343	278	114	49	23
166	0	120	0	12	0	26	53	394	399	25	2149	810	0	228	258	134	101	89
167	0	0	0	15	23	13	0	110	25	10	4067	1390	0	307	395	251	210	227
168	0	0	0	19	0	15	16	100	45	20	3897	1309	0	291	372	236	197	212
169	0	0	0	0	31	0	0	110	0	4	3995	1493	0	423	479	245	185	160
170	0	114	0	0	0	15	15	154	71	6	4170	1224	0	184	288	231	219	304
171	0	0	0	0	0	0	0	25	68	2	3035	1057	0	245	307	189	155	161
172	0	13	0	38	20	52	19	1072	522	5	3115	1198	0	333	380	199	151	134
173	0	79	0	18	264	127	373	941	859	17	4443	1661	0	447	519	280	217	198
174	0	19	0	0	20	0	31	105	52	4	2611	923	0	220	271	163	133	135
175	0	53	0	0	0	8	65	169	339	4	3638	1311	0	323	392	229	184	182
176	0	12	1	33	184	30	69	246	298	10	3840	1455	1	392	455	245	190	173
177	0	93	81	0	0	6	0	15	23	2	144	112	43	56	27	9	2	0
178	0	0	345	0	0	4	59	175	90	36	1502	2288	721	1696	0	0	0	0
179	0	38	1391	0	47	13	36	93	124	86	33	488	2584	0	0	0	0	0
180	0	30	1166	0	57	16	36	74	75	32	547	441	924	106	91	40	19	10

TABLE C-2 (Continued)
SOCIOECONOMIC PROJECTIONS BY TAZ - YEAR 2020 BASE SCENARIO

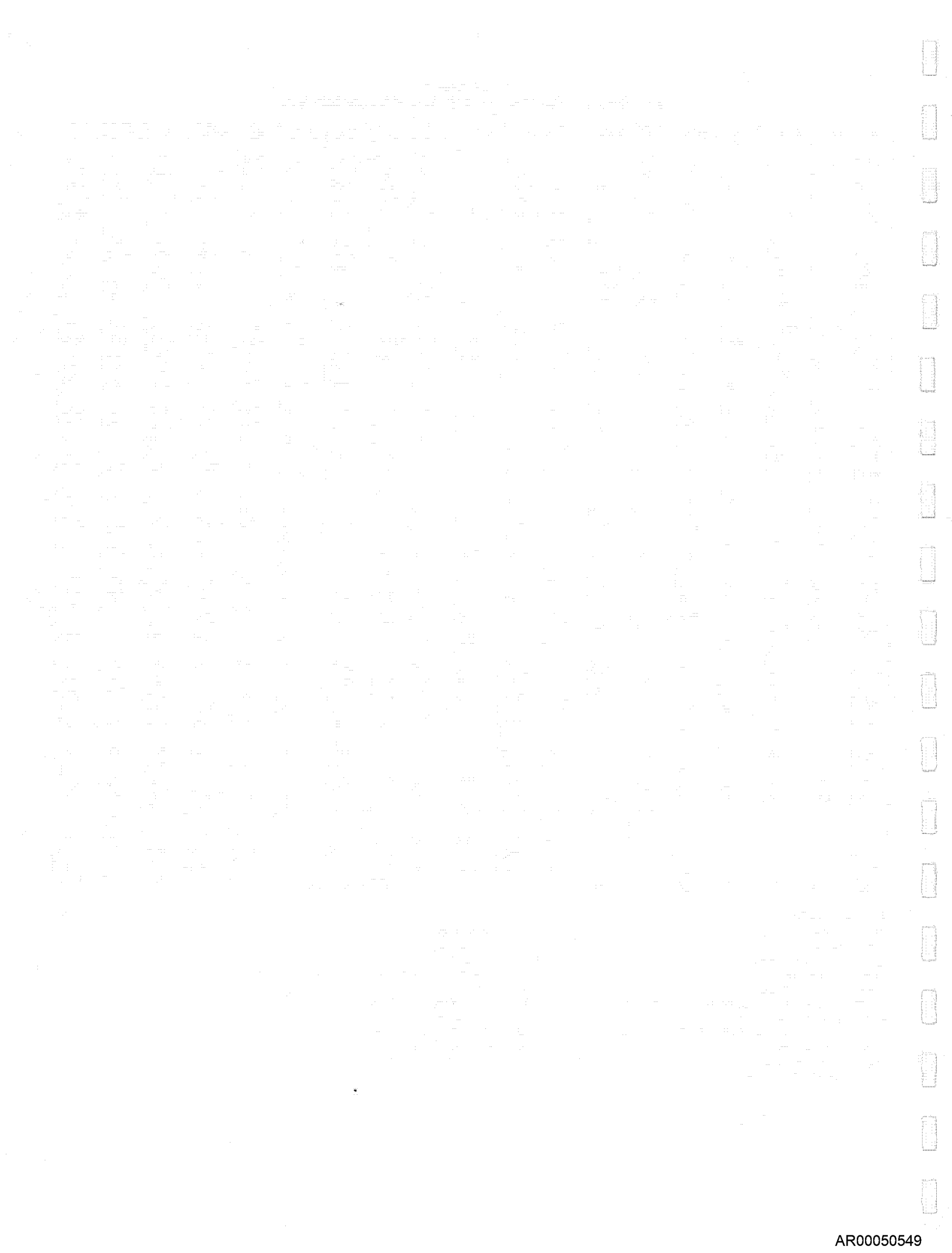
TAZ	MiE	GovE	HotE	AgE	TCUE	IndE	FIRE	SvcE	RetE	ConE	Pop	HU	HR	1RU	2RU	3RU	4RU	5RU
181	0	193	0	0	0	2	0	138	0	1	36	11	0	7	3	1	0	0
182	0	64	144	0	121	11	64	1240	553	18	2510	1720	279	941	465	156	31	6
183	1120	398	0	18	37	29	44	397	129	0	1374	608	0	209	209	93	58	39
184	0	197	0	0	0	88	44	977	54	7	3948	1354	0	337	407	236	189	185
185	0	73	0	16	21	27	16	286	229	8	3118	1071	0	246	310	192	158	165
186	0	32	0	18	16	108	40	318	372	42	3788	1468	0	412	468	243	184	162
187	0	13	0	0	0	0	44	220	23	9	3955	1498	0	424	480	246	186	162
188	0	56	0	0	0	0	137	352	89	0	2234	933	0	294	317	142	101	78
189	0	119	0	0	231	80	722	1348	1671	24	3341	1505	0	532	515	232	136	89
190	0	52	191	0	68	29	15	621	134	1	577	437	301	195	141	31	2	0
191	0	0	0	11	0	34	0	224	29	49	4424	1769	0	323	744	360	237	104
192	23	0	0	23	31	33	28	72	20	49	4021	1886	0	723	613	272	186	91
193	0	14	0	23	70	35	33	503	140	64	6368	2892	0	985	1013	448	304	143
194	0	34	0	19	0	44	40	291	163	26	5714	2300	0	566	829	425	317	163
195	0	25	0	0	0	0	77	115	109	2	1547	654	0	139	280	133	73	28
196	0	100	0	0	59	28	364	524	592	124	9710	3610	0	591	1451	744	553	272
197	0	37	0	18	113	38	144	846	686	209	12432	5450	0	1480	2153	1000	580	238
198	0	0	0	0	0	0	0	577	194	109	9267	3094	0	367	990	693	629	414
199	79	96	0	394	23	75	15	631	229	34	10000	2722	0	201	602	563	636	720
200	0	7	0	0	18	15	17	215	46	4	1497	746	0	246	318	132	40	10
201	0	226	1	0	188	106	458	1174	1004	50	8677	2955	2	444	980	614	525	392
202	0	35	0	0	78	49	62	307	206	19	4232	1426	0	208	465	298	258	197
203	0	0	0	1	0	11	21	100	32	7	7213	2796	0	562	1111	527	381	215
204	0	15	0	0	0	73	45	716	37	12	3758	1190	0	183	401	246	208	152
205	0	0	0	37	16	55	13	431	338	6	4054	1440	0	239	506	293	238	164
206	0	86	0	70	64	65	62	872	728	8	2367	894	0	169	340	174	131	80
207	0	12	1	16	139	101	0	399	101	12	4593	1799	2	364	718	338	243	136
208	0	14	1	0	27	13	0	478	0	3	3151	1088	2	168	367	225	189	138
209	0	66	0	0	47	12	54	195	170	2	2909	1033	0	171	363	210	171	118
210	5720	465	0	0	107	0	64	419	356	0	10896	2030	0	192	518	428	446	447
211	0	59	1	14	51	38	56	255	256	17	3935	1526	10	300	597	289	212	122
212	0	95	0	48	10	0	72	421	64	2	3985	1285	0	201	437	265	222	160
213	0	142	0	144	68	171	96	893	867	13	5404	1759	0	248	563	369	325	255
214	0	0	0	0	0	0	0	72	0	5	3670	1183	0	153	361	250	228	190
215	0	31	0	71	43	28	13	440	295	12	3062	1023	0	146	329	214	188	146
216	0	169	0	41	41	45	116	930	319	20	5179	1601	0	204	484	339	312	262
217	51	92	0	51	90	228	65	1964	1152	242	11766	4265	0	743	1545	855	677	445
218	0	35	0	27	170	10	143	666	371	12	2257	704	0	107	235	146	124	92
219	234	95	35	41	141	61	41	1775	692	240	12180	4243	48	674	1454	871	723	516
220	0	14	0	23	37	0	0	54	123	56	6758	2275	0	333	744	474	410	312
221	0	114	57	21	92	28	89	451	419	73	5169	2459	102	914	878	349	162	124
222	0	108	124	103	43	17	82	3756	581	294	9147	2528	172	524	700	379	303	584
223	0	142	1918	115	244	31	60	842	883	670	2665	1731	3023	331	342	162	95	122
224	0	47	3	96	39	28	20	936	316	184	5456	2190	4	640	756	350	249	195
225	234	148	0	69	108	51	43	728	377	78	2178	769	0	222	264	124	89	70
226	741	27	0	12	0	163	0	23	68	0	4443	1182	0	104	258	256	283	281
227	1761	0	0	0	0	0	0	0	14	0	2420	704	0	98	198	156	143	109
228	0	249	0	97	0	0	139	1179	772	6	7648	2626	0	440	814	569	481	321
229	0	891	0	93	728	319	175	2000	1450	36	4608	1703	0	339	581	354	273	156
230	0	307	0	0	130	79	113	835	572	16	5631	2124	0	444	745	434	325	177
231	12473	555	5	44	26	13	33	583	847	0	18627	3564	8	333	805	776	840	808
232	0	162	0	201	86	36	116	585	514	50	4915	1600	0	311	445	295	252	297
233	10	17	1	289	16	429	0	483	157	91	6475	2447	2	639	793	416	315	283
234	0	0	662	18	37	12	1	1477	691	455	8745	4033	1045	1312	1350	558	353	241
235	142	309	9	172	250	147	277	3085	1600	385	13301	4314	12	957	1220	675	638	814
236	0	0	13	0	55	24	1	1608	605	375	9969	2868	17	500	708	453	469	723
237	429	160	0	96	244	35	46	459	130	46	7033	1941	0	297	446	308	331	560
238	253	317	0	60	68	112	0	518	141	131	13242	3240	0	346	607	497	580	1211
239	39	53	0	246	24	39	8	100	31	3	631	199	0	30	52	42	40	35
240	0	10	0	10	8	59	0	2	0	142	7519	2154	0	245	517	443	449	500

TABLE C-2 (Continued)
SOCIOECONOMIC PROJECTIONS BY TAZ - YEAR 2020 BASE SCENARIO

TAZ	MiE	GovE	HotE	AgrE	TCUE	IndE	FIRE	SvcE	RetE	ConE	Pop	HU	HR	1RU	2RU	3RU	4RU	5RU
241	0	31	0	20	12	0	24	15	54	19	5484	1684	0	233	451	350	328	323
242	0	0	0	10	20	3	4	165	48	135	7981	3127	0	740	1132	583	420	252
243	0	0	0	0	0	11	0	1135	38	177	830	382	0	119	149	69	33	13
244	0	0	0	36	7	16	1	3520	1030	944	17683	5124	0	595	1245	1056	1061	1167
245	0	1059	0	18	500	0	3751	15912	4805	3606	7792	2258	0	262	549	466	467	514
246	0	0	0	0	0	0	0	0	0	0	820	206	0	14	36	40	47	69
247	0	0	0	0	0	0	0	0	0	298	18004	4578	0	324	838	892	1041	1483
248	0	59	1695	72	0	2193	79	1348	2457	1241	0	604	2661	0	0	0	0	0
249	0	0	0	18	0	5018	0	0	0	694	1784	517	0	60	125	107	107	118
250	0	882	0	72	105	522	12	201	113	105	27	0	0	0	0	0	0	0
251	3010	1222	0	55	38	39	35	324	551	0	4181	1329	0	345	503	243	157	82
252	0	9	381	37	0	386	34	891	336	562	16287	5263	599	761	1426	1063	969	908
253	0	80	7	15	207	486	150	672	328	23	2368	630	10	52	126	125	139	183
254	0	196	0	0	0	0	0	311	13	15	6056	1412	0	64	197	252	327	572
255	140	84	0	0	0	0	0	311	53	0	5230	1520	0	191	385	315	307	323
256	0	0	0	22	0	0	0	37	0	349	13756	6015	0	1720	2301	1116	605	272
257	0	59	0	72	13	54	0	18	113	24	4328	1203	0	121	270	245	259	308
258	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0
259	0	59	0	36	7	27	1	37	113	12	490	185	0	41	64	36	27	17
260	0	59	0	18	0	0	1	18	0	67	3225	935	0	109	227	193	193	213
261	0	0	0	18	0	0	0	0	0	4	159	46	0	5	11	9	10	10
262	0	25	0	39	65	56	2	74	71	17	1294	447	0	83	140	91	75	58
263	0	78	0	115	261	315	44	667	641	10	3389	1142	0	182	345	249	216	150
264	39	51	0	0	0	0	0	83	0	2	0	0	0	0	0	0	0	0
265	0	89	0	47	0	80	155	683	769	28	6488	1684	0	109	309	353	425	487
266	0	112	0	5	113	36	0	234	83	9	7069	1665	0	63	220	317	434	630
267	0	25	0	0	0	0	0	18	0	0	2053	471	0	15	56	86	123	192
268	0	0	0	203	194	576	0	0	40	22	6996	1758	0	98	295	361	451	554
269	0	180	0	44	31	48	141	705	878	7	7883	2286	0	230	538	501	528	489
270	0	12	0	4	0	0	17	569	228	63	3815	1139	0	127	283	252	254	223
271	0	0	0	1	0	100	86	2402	989	354	7636	2808	0	550	949	587	457	265
272	0	0	0	8	0	0	0	15	5	41	2928	1072	0	208	360	225	176	103
273	0	0	0	135	0	0	335	6941	2976	869	4568	1344	0	142	325	296	305	276
274	117	0	0	4	0	0	142	1914	846	297	4871	1785	0	347	601	374	292	171
275	70	59	0	0	9	1	0	92	112	0	6190	1936	0	250	522	429	407	328
276	0	78	0	0	14	1	25	46	0	1	3492	1166	0	181	348	255	224	158
277	0	20	0	0	5	1	8	0	28	2	3859	1361	0	243	437	292	239	151
278	35	156	0	0	28	4	67	367	197	0	4220	1322	0	171	358	293	278	223
279	246	0	0	0	900	2917	8	1846	28	469	6776	2566	0	534	898	525	394	215
280	0	0	0	0	100	1	86	4345	1753	787	21272	7249	0	1189	2223	1577	1347	914
281	351	78	0	0	37	5	59	367	197	0	10120	3373	0	522	1003	739	648	460
282	156	25	0	37	62	177	87	260	242	33	11281	4224	0	861	1460	871	663	369
283	117	0	0	22	0	0	0	707	256	180	7581	2737	0	515	904	579	461	278
284	0	74	0	11	11	50	5	35	20	18	1268	554	0	151	217	106	58	22

List of Abbreviations:

TAZ	- Traffic Analysis Zone	Pop	- Population
MiE	- Military Employment	HU	- Housing Units
GovE	- Government Employment	HR	- Hotel Rooms
HotE	- Hotel Employment	RU	- Resident Units (Housing Units less Resort Condos)
AgrE	- Agriculture Employment	GQP	- Group Quarter Population
TCUE	- Transportation, Communication and Utilities Employment	1RU	- 1-Person Residential Units
IndE	- Industrial Employment	2RU	- 2-Person Residential Units
FIRE	- Finance, Insurance and Real Estate Employment	3RU	- 3-Person Residential Units
SvcE	- Service Employment	4RU	- 4-Person Residential Units
RetE	- Retail Employment	5RU	- 5-Person Residential Units
ConE	- Construction Employment		



APPENDIX D

IMPROVEMENTS IDENTIFIED FOR POSSIBLE DEVELOPER FUNDING

**TABLE D-1
CAPITAL IMPROVEMENTS IDENTIFIED FOR POSSIBLE DEVELOPER FUNDING
2020 OAHU REGIONAL TRANSPORTATION PLAN**

Map #	Facility	Location	Description	Estimated Cost [a]	Possible Developer % [b]	Developer Cost [a,b]
STATE PROJECTS: 1995-2000						
S27.	Interstate H-1	Kapolei Interchange	Construct new interchange per Ewa Master Plan	\$19.0M	100%	\$19.0M
S2.	Interstate H-1	Makakilo Interchange	Improve existing interchange per Ewa Master Plan	\$4.0M	100%	\$4.0M
S5.	Interstate H-2*	Millilani Interchange	Improve interchange: • Relocate existing SB off-ramp • Construct new WB to SB loop on-ramp	\$7.2M	100%	\$7.2M
S6.	Interstate H-2*	Waipio Interchange	Improve interchange: • Construct new WB to SB loop on-ramp • Widen existing NB off-ramp	\$16.0M	100%	\$16.0M
S10.	Fort Barrette Rd	H-1 to Kapolei Pkwy	Widen to 4 lanes per Ewa Master Plan	\$7.0M	50%	\$3.5M
S23a.	Kunia Rd	H-1 Kunia Interchange to Royal Kunia	Widen Kunia Rd to 4 lanes; widen H-1 Kunia IC NB off-ramp to 2 lanes	\$5.5M	100%	\$5.5M
S26.	Ward Av	Ala Moana Bl to Keawe St	Extend Ward Av to Keawe St via Ilalo St (HCDA project)	\$40.1M	50%	\$20.1M
CITY PROJECTS: 1995-2000						
C2.	Farrington Hwy*	Kalaeloa Rd to Fort Weaver Rd	Widen to 4 lanes	\$26.0M	50%	\$13.0M
C4.	Kapiolani Bl*	Atkinson Dr to Hauoli St	Widen to 8 lanes & other improvements for Honolulu Convention Center	\$5.0M	50%	\$2.5M
C5.	Kapolei Pkwy	Ko Olina to Ewa North-South Rd	Construct new road per Ewa Master Plan	\$37.0M	100%	\$37.0M
STATE PROJECTS: 2001-2005						
S17.	Interstate H-1	Palailai Interchange	Improve existing interchange per Ewa Master Plan	\$3.1M	100%	\$3.1M
S19.	Ewa North-South Rd*	H-1 to Papipi Rd	New mauka-makai roadway & interchange with H-1 per Ewa Master Plan	\$24.5M	100%	\$24.5M
S20.	Fort Weaver Rd/Kunia Rd	H-1 to Renton Rd	Widen to 6 lanes per Ewa Master Plan	\$16.1M	50%	\$8.1M
S21.	Kalaeloa Bl corridor	H-1 to business/industrial park	Provide 7 to 8 lanes in corridor per Ewa Master Plan	\$15.5M	50%	\$7.8M

TABLE D-1 (continued)
CAPITAL IMPROVEMENTS IDENTIFIED FOR POSSIBLE DEVELOPER FUNDING
2020 OAHU REGIONAL TRANSPORTATION PLAN

Map #	Facility	Location	Description	Estimated Cost [a]	Possible Developer % [b]	Developer Cost [a,b]
S23b.	Kunia Rd	H-1 to Royal Kunia	Widen to 6 lanes	\$11.0M	100%	\$11.0M
4.	Central HOV System	H-2 inbound connector through Waiawa Interchange	Widen H-2 inbound connector & bridges to provide outbound contraflow HOV during PM peak period	\$8.0M	20%	\$1.6M
STATE PROJECTS: 2006-2020						
S29.	Interstate H-2	H-2 between Mililani Interchange & Waipio Interchange	New interchange serving area mauka of H-2 s/o Kipapa Gulch	\$19.0M	100%	\$19.0M
S30.	Interstate H-2	H-2 between Waiawa Interchange & Waipio Interchange	New interchange serving Waipio Mauka/Gentry area	\$19.0M	100%	\$19.0M
S31.	Farrington Hwy	H-1 terminus in Kapolei to Nanakuli	Widen to 6 lanes	\$27.5M	50%	\$13.8M
S32.	Farrington Hwy Interchanges	Makaiwa Hills interchanges	Construct new interchanges	\$38.0M	100%	\$38.0M
S37.	Kamakee St*	Ala Moana Bl to Kapiolani Bl	Acquire 20' additional R/W & widen to 4 lanes (HCDA project)	\$18.0M	50%	\$9.0M
S40.	Kunia Rd	Royal Kunia to Wahiawa	Widen to 4 lanes	\$40.5M	100%	\$40.5M
S42.	Queen St & Pohukaina St*	Punchbowl St to Pensacola St	Street extensions for one-way couplet (HCDA project)	\$4.5M	50%	\$2.3M
9.	Leeward HOV System	H-1 from Makakilo Interchange to Waiawa Interchange	Construct H-1 HOV median lanes	\$61.0M	20%	\$12.2M
CITY PROJECTS: 2006-2020						
C18.	Central East-West Rd	Extension of Ka Uka Bl to Kunia Rd	New 4-lane east-west road	\$70.1M	100%	\$70.1M
C19.	Central Mauka Rd	Mililani Mauka (or Leilehua Interchange) to Kamehameha Hwy stub at Waiawa (or Moanalua Rd extension); parallel to & mauka of H-2	New 4-lane north-south road (with connections to H-2 interchanges)	\$160.0M	100%	\$160.0M

Notes:

* Denotes baseline project.

a. All cost estimates are in millions of 1994 dollars and include design, right-of-way, and construction.

b. Estimated potential developer funding level for the purposes of this plan. Not intended to establish developer funding obligations or commitments, which would be determined on a project-by-project basis through future studies and negotiations outside of the ORTP effort (see Chapter VI).

TABLE D-2
SUMMARY OF IMPROVEMENT COSTS ALLOCATED TO POSSIBLE DEVELOPER FUNDING*
2020 OAHU REGIONAL TRANSPORTATION PLAN

MILLIONS OF 1994 DOLLARS				
	1995-2000	2001-2005	2006-2020	Total
Highway Capital Projects	\$127.8	\$54.5	\$371.7	\$554.0
HOV Capital Projects	\$0.0	\$1.6	\$12.2	\$13.8
Park-and-Ride Lots	\$2.7	\$4.0	\$0.0	\$6.7
TMA Operating Costs	\$2.1	\$5.1	\$17.9	\$25.1
Total	\$132.6	\$65.2	\$401.8	\$599.6

MILLIONS OF YEAR-OF-EXPENDITURE DOLLARS				
	1995-2000	2001-2005	2006-2020	Total
Highway Capital Projects	\$146.9	\$77.6	\$794.3	\$1,018.8
HOV Capital Projects	\$0.0	\$2.3	\$26.1	\$28.4
Park-and-Ride Lots	\$3.1	\$5.7	\$0.0	\$8.8
TMA Operating Costs	\$2.4	\$7.3	\$38.4	\$48.1
Total	\$152.4	\$92.9	\$858.8	\$1,104.1

Notes:

- * Table indicates estimated potential developer funding levels for the purposes of this plan. Not intended to establish developer funding obligations or commitments, which would be determined on a project-by-project basis through future studies and negotiations outside of the ORTP effort (see Chapter VI).

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in all financial dealings.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the sampling process and the statistical methods employed to interpret the results.

3. The third part of the document presents the findings of the study. It includes a series of tables and graphs that illustrate the trends and patterns observed in the data. The results show a clear correlation between the variables studied.

4. The fourth part of the document discusses the implications of the findings and provides recommendations for future research. It suggests that further studies should be conducted to explore the underlying causes of the observed trends and to develop effective strategies to address the issues identified.

5. The fifth part of the document concludes the study and summarizes the key points. It reiterates the importance of accurate record-keeping and the need for ongoing monitoring and evaluation of the system.

APPENDIX E

CORPS OF ENGINEERS COMMENTS

Corps of Engineers Comments on ORTP Projects

Project	Corps of Engineers Comments
Interstate H-1-Kunia Interchange	There are irrigation ditches near the interchange and an intermittent stream to the east of the interchange. More information and a site visit are needed.
Interstate H-1 - Middle St to Kapiolani Interchange	Crosses numerous streams. We assume no new construction.
Interstate H-1 - Pali Hwy East bound ramp	No apparent waters in the immediate vicinity
Interstate H-1 - Halawa Interchange to Kamehameha Hwy	Halawa stream is crossed by the interchange
Farrington Hwy - Ala Hema St to Jade St	Crosses an intermittent tributary and possibly a salt marsh.
Farrington Hwy - Nanakuli, Maili, Waianae, Makaha	No comment; Need additional information
Kahekili Hwy - Likelike Hwy to Kamehameha Hwy	Crosses several streams including Kahaluu Stream
Kahekili Hwy - Likelike Hwy to Haiku Rd	Crosses Keaainaia and Kapunahala Streams
Kamehameha Hwy - Lumaina St to KaUka	Crosses 3 irrigation ditches
Pali Hwy - Castle Junction	Kahanaiki Stream nearby
Puuloa Rd - Kamehameha Hwy to Salt Lake Bl	Near Salt Lake - Coastal wetlands
Sand Island Parkway- treatment plant to park	Intermittent streams parallel to roadway. Possible coastal wetlands
Dillingham Bl - Nimitz to Kalihi St	No apparent waters. More information needed
Kalia Road - Ala Moana to Saratoga Rd	No apparent waters. More information needed.

Corps of Engineers Comments on ORTP Projects

Project	Corps of Engineers Comments
Liliha St - H-1 to King St	No apparent waters. More information needed.
Moanalua Rd - Aiea Hgts to Aiea Interchange	Intermittent streams
Philip St - Kalakaua	Intermittent streams
Salt Lake Bl - Kahuapaani St to Ala Lilikoi	Intermittent streams
Waianae Coast	Coastal perennial waters (canals) and intermittent streams
Ward Ave - Beretania to Kinau	No apparent waters. Need more information.
Ford Island Access Road	DA permit applied for and being evaluated
Interstate H-1 - Waiawa Interchange	Panakanohi Stream and Waiawa Springs in the vicinity.
Kalaniana'ole Hwy - Kailua Rd to Castle Jct	Site visit. Crossing Mauawili and Kahanaiki Streams and possibly marsh. Any temporary construction impacts associated with these construction projects <u>may</u> require Department of the Army authorization.
Sand Island Access - Auiki to Nimitz	No apparent waters. More information needed.
Vineyard Bl - Punchbowl to Nuuanu	Pauoa Stream - perennial at Nuuanu Av.
Kamehameha - Haiku Rd to Ipuku St	No apparent waters. More information needed.
Kaukonahua Rd - Mauka of Thompson Corner	No apparent waters.
Keaumoku St - H-1 to Lunalilo	No apparent waters. More information needed.
King St - Middle St to Liliha	Crosses Kapalama Stream drainage canal.

Corps of Engineers Comments on ORTP Projects

Project	Corps of Engineers Comments
Interstate H-1 - University Interchange	No apparent waters. More information needed.
Kahikili Rd - Likelike Interchange	Kaneohe Stream
Kalaniana'ole Hwy - Keolu Dr. to Kailua Rd	Intermittent streams
Kalaniana'ole Hwy - Waimanalo Beach to Saddle City	Perennial and intermittent streams
Kamehameha Hwy - Castle Jct to H-3	Perennial and intermittent streams
Kamehameha Hwy - Ka'uka to Lanikuhana	Crosses Kipapa Stream
Likelike - Kamehameha to Kahakili	Crosses two perennial streams
Alakea St - Queen to King	No apparent waters. More information needed.
Auiki St - Sand Island Access to Nimitz	Crosses Kapalama Basin and coastal waters
Kailua Rd - Hahani to Wana'ao	No apparent waters. More information needed.
Kamehameha - Haleiwa	Anahulu and Paukauila River in vicinity.
McCully - Kapiolani to King	No apparent waters. More information needed.
McCully - Beretania to Dole	No apparent waters. More information needed.
Mokau'ea St - Nimitz to Dillingham	No apparent waters. More information needed.
Puuhale St - Nimitz to Dillingham	No apparent waters. More information needed.
Vicinity of University Av. - Kapiolani to Ala Wai	Crosses Ala Wai Canal; a jurisdictional water
Lusitana St & Punchbowl St. - Vicinity of Vineyard	No apparent waters. More information needed.

Corps of Engineers Comments on ORTP Projects

Project	Corps of Engineers Comments
Exhibit Two	When final locations are determined, these projects may require Department of the Army authorization.
Exhibit Three	When final locations are determined, these projects may require Department of the Army authorization.
Exhibit Four	Any new construction in jurisdictional waters will likely require Department of the Army authorization.
Interstate H-1 - Makakilo Interchange	A perennial stream and ponded area in the vicinity
Interstate H-2 - Mililani Interchange	Irrigation ditch may be jurisdictional. More information needed.
Interstate H-2 - Waipio Interchange	Waikakalaua ditch may be jurisdictional. More information needed.
Fort Barrette Rd - H-1 to Kapolei	May cross Kaloi Gulch, which is jurisdictional.
Farrington Hwy - Kalaeloa Rd to Fort Weaver	Crosses intermittent streams, ditches, perennial streams, etc.
Kapiolani Bl - Atkinson Dr. to Hauoli St	Crosses Ala Wai Canal
Kapolei Pkwy- KoOlina to Ewa N-S Rd	When route is identified the work may involve Corps jurisdiction.
Interstate H-1 - Palailai Interchange	When final plans are presented, may involve Corps jurisdiction.
Ewa North South Rd - H-1 to Papipi	When route is identified, may involve waters.
Fort Weaver Rd - H-1 to Renton	Crosses Honouliuli Stream and other streams.
Kalaeloa Bl corridor - H-1 to business park	When route is identified, may involve waters.
Kunia Rd - H-1 to Royal Kunia	Crossing streams; may involve Corps jurisdiction.

Corps of Engineers Comments on ORTP Projects

Project	Corps of Engineers Comments
Ward Av. - Ala Moan to Keawe St	When exact route is determined, may involve coastal waters.
Interstate H-1 - Kapolei Interchange	When location is determined, may involve waters
Interstate H-2 - Mililani Inter to Waipio Inter	When route is determined, may involve waters.
Interstate H-2 - Waiawa to Waipio	When final routes are located, may involve waters.
Farrington Hwy - Kapolei to Nanakuli	Crossing streams may involve waters of the U.S.
Farrington Hwy Interchanges - Makaiwa Hills	New locations may involve waters of the U.S.
Kalaniana'ole Hwy - Laukahi to Kilauea	Crossing several streams, may require a permit.
Kamakee - Ala Moana to Kapiolani	No apparent waters. Need more information.
Kunia Rd - Royal Kunia to Wahiawa	Crossing numerous streams
Queen St & Pohukaina - Punchbowl to Pensacola	No apparent waters in these areas. More information needed.
Central East-West Rd - Ext of KaUka to Kunia	When route is determined; may involve Corps jurisdiction.
Central Mauka Rd	When final locations are determined; this project may require DA authorization
Waipahu St - Kamehameha to Kunia	Crosses Waikele Stream
Exhibit 6	When final locations are determined, these projects may require Department of the Army authorization.



